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BOARD OF EDITORS { Mr. Horace E. Smith, Chief Clerk Weather Bureau,
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INTRODUCTION.

This REVIEW is based on reports for October, 1891, from 2,541 regular and voluntary observers. These reports are classified as follows: 158 reports from Weather Bureau stations; 118 reports from United States Army post surgeons; 1,640 monthly reports from state weather service and voluntary observers; 32 reports from Canadian stations; 193 reports through the Central Pacific Railway Company; 400 marine reports through the co-operation of the Hydrographic Office, Navy Department; marine reports through the "New York Herald Weather Service;" monthly reports from the local weather services of Ala-

bama, Arizona, Arkansas, California, Colorado, Florida, Georgia, Illinois, Indiana, Iowa Weather and Crop Service, Kansas, Kentucky, Louisiana, Maryland, Michigan, Minnesota, Mississippi, Missouri, Nebraska, Nevada, New England, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Utah, Virginia, Washington, West Virginia, Wisconsin, and Wyoming, and international simultaneous observations. Trustworthy newspaper extracts and special reports have also been used.

CHARACTERISTICS OF THE WEATHER FOR OCTOBER, 1891.

The month was cooler than usual east of the Rocky Mountains and south of the Ohio Valley and the lower lake region, and was warmer than the average October along the Pacific coast, over the Rocky Mountain and plateau regions, and in the middle and upper Missouri and upper Mississippi valleys and the upper lake region. At points in Montana, Oregon, and Washington it was the warmest, and at stations in the south Atlantic and east Gulf states it was the coolest October on record. On the north Pacific coast, and from the lower Missouri valley over the Lake region, New York, south New England, and New Jersey the maximum temperature was the highest, and on the south and east New England coasts the minimum temperature was the lowest ever reported for October.

The line of freezing weather extended over the east Gulf states nearly to the coast line during the third decade of the month, with heavy frost as far south as southern Georgia, central Alabama, and central Louisiana. From the 21st to the 24th light frost was noted in the interior of the Florida Peninsula to about the 28th parallel.

PRECIPITATION.

The monthly precipitation was generally deficient, an excess appearing only along the immediate Atlantic coast north of the 33d parallel, in Kansas and southeast Nebraska, on the northeast slope of the Rocky Mountains, and along the north Pacific coast. At points on the middle Virginia coast, in northeast Kansas, and southern Montana the monthly precipitation was the greatest, and at stations in the east and west Gulf states, the central Ohio valley, the upper lake region, Arkansas, Indian Territory, Texas, western Colorado, northeast Washing-

ton, and southern California it was the least ever noted for October.

Snow fell to the depth of ten to fifteen inches on the northeast slope of the Rocky Mountains and in northwest North Dakota, and the snowfall exceeded five inches in the mountains of Colorado. In the central valleys snow fell as far south as southern Kansas and central Kentucky, and it was reported in the Alleghany Mountains to western North Carolina. The first snow of the season was reported in the Missouri Valley, in Iowa, and over the east part of the middle plateau region during the first decade, in the north part of the upper lake region, in central Kentucky and northern New York during the second decade, and in the Alleghany Mountains, New York, and New England during the third decade of the month.

STORMS.

No well-defined tornadoes were reported. The storms of the north Atlantic Ocean were of exceptional seasonal severity. Heavy gales occurred along the North Carolina, middle Atlantic, and New England coasts. Storms of great energy prevailed in the Lake region on the 26th and 31st, in the Dakotas and Minnesota on the 30th, and on the north Pacific coast on the 18th.

DROUGHT.

Damaging drought prevailed in the southern and southwestern states, and in parts of New England and the Middle and Western States. Rivers and streams in the south-central valleys and the Southern States were very low. On the Tennessee, Red, and Chattahoochee rivers traffic was practically suspended, and navigation on the Ohio and Mississippi rivers was rendered difficult on account of low water.

ATMOSPHERIC PRESSURE (expressed in inches and hundredths).

The distribution of mean atmospheric pressure for October, 1891, as determined from observations taken daily at 8 a. m. and 8 p. m. (75th meridian time), is shown on Chart II by isobars.

In October there is usually an increase in mean pressure over the North American continent, and a decrease in pressure over the north Atlantic Ocean. The normal pressure is highest over the region lying between the 30th and 40th

parallels and the Mississippi River and the Atlantic coast, where it is above 30.10; an area with normal pressure above 30.10 also extends from the Pacific Ocean over Oregon and south Idaho. The normal pressure is lowest north of the 50th parallel and over the extreme southwest part of the country, where it is below 30.00.

In October, 1891, the mean pressure was above 30.15 in an area which extended from the Gulf and south Atlantic states and the Ohio Valley over the middle plateau region, and was lowest over eastern Nova Scotia and the west part of the southern plateau region, where it was below 29.95.

A comparison of the pressure chart for October, 1891, with that of the preceding month shows a general and marked increase in pressure over the interior and western parts of the country, and a decrease along the New England and Nova Scotia coasts and thence over the middle Atlantic states, the upper Ohio valley, and the east half of the Lake region. The greatest increase in mean pressure occurred over the middle plateau region, where it was more than .20, and the most marked decrease along the Nova Scotia and New England coasts, where it exceeded .10.

The mean pressure was above the normal, except along the Atlantic coast, in New England, in Canada east of Manitoba, and along the Pacific coast north of the 40th parallel. The greatest departure above the normal pressure occurred on the west coast of the Gulf of Mexico, and from the east part of the middle plateau region over the middle-eastern slope of the Rocky Mountains, where it was more than .10, and the most marked departure below the normal was noted over eastern Nova Scotia, where it was .10.

A reference to Charts IV and I will show that the area of highest mean pressure occupies the region traversed by a large proportion of the areas of high pressure traced for the month, and that a number of the more energetic low areas advanced from the ocean over Nova Scotia, where, as a consequence, the mean pressure was lower than usual. It will also be observed that the abnormal distribution of pressure for the month had the apparent effect of causing an unusual prevalence of northerly winds over the eastern part of the country, where the month was cooler than usual. It will also be noted that there was a general and marked deficiency in monthly precipitation, except along the immediate Atlantic coast, where heavy rains fell under the influence of the low areas which passed up the coast, in the extreme northwest part of the country near the tracks of low areas from the Pacific Ocean, and along the path of the severe storm which crossed the middle-eastern slope of the Rocky Mountains the first of the month. Throughout the greater part of the region occupied by the area of abnormally high pressure there was a marked deficiency of rainfall.

HIGH AND LOW AREAS.

The paths of well-defined areas of high and low pressure which appeared during the month are plotted on Charts IV and I, respectively, and some of the more prominent features of the areas are shown in the table at the end of this chapter.

HIGH AREAS.

Ten high areas appeared, the average number noted for October during the last 15 years being 7.5. Of the high areas traced 5 appeared on the Pacific coast; 3 advanced from the British Northwest Territory; one was central over New England at the opening of the month; and one first appeared north of the Lake region. Of the Pacific coast areas 3 traversed the continent, one passing off the middle Atlantic coast and thence moving northeastward, one reaching the south Atlantic coast, and one the east part of the Gulf of Mexico. One of the Pacific coast areas moved eastward over the plateau region, thence northward over Montana, and thence southward over the eastern slope of the Rocky Mountains to Indian Territory, where it disappeared, and another moved northward along the middle and north Pacific coasts, and thence eastward to the region north of Montana. Of the areas which advanced from the British Northwest Territory,

one advanced to Nova Scotia, one disappeared over the middle Mississippi valley, and one passed southeastward to the Gulf of Mexico. The high area which occupied New England the first day of the month moved south and west of south and disappeared over the east Gulf states, and the area which first appeared north of the Lake region passed thence south of east to Nova Scotia. The highest pressure reported for the month was 30.76, at Montreal and Quebec, Quebec, the morning of the 12th. The following is a brief description of the high areas referred to:

I.—At the opening of the month this high area occupied New England, a trough of low pressure extended from Manitoba to Arizona, and the pressure was high over the British Northwest Territory. Light frost was reported the morning of the 1st from northern Ohio to Massachusetts, and heavy frost in northern Vermont. Moving slowly southward along the middle Atlantic coast during the 2d high area I passed thence west-southwest and disappeared by a gradual decrease of pressure over the east Gulf states during the 4th, its rate of progress, 16 miles per hour, being the least noted in connection with the high areas of the month.

II.—During the 1st and 2d the pressure was high over the British Northwest Territory, and the morning of the 2d high area II appeared off the Oregon coast, with the lowest temperature of the month at points along the Pacific coast, light frost at Port Angeles, Wash., and heavy frost at Walla Walla, Wash., and Carson City, Nev. During the 2d the high area moved to northern Utah; the lowest temperature of the month was recorded at points in the northern plateau region and on the northeast slope of the Rocky Mountains, where it was 9° to 13° below freezing; the greatest abnormal temperature fall in 12 hours noted for the month, 29°, occurred at Concordia, Kans.; and heavy frost was reported in the middle and northern plateau regions. During the 3d the high area remained nearly stationary over north Utah and southwest Wyoming; cool weather continued over the middle Missouri valley and the Dakotas; the lowest temperature of the month was noted at stations in the west part of the plateau region and on the south Pacific coast; and heavy frost occurred in the plateau region to south Arizona and eastward to the Dakotas. During the 4th the area apparently moved northward over Montana, the temperature was below freezing only in the British Northwest Territory and at points in the middle plateau region, and heavy frost was reported on the eastern slope of the Rocky Mountains, in Kansas, and north New Mexico. During the 5th and 6th the high area moved southward east of the Rocky Mountains and during the 7th disappeared by a decrease of pressure over the southeast slope of the Rocky Mountains. On the 5th the temperature was below freezing on the northeast slope of the Rocky Mountains and in the middle Missouri valley, and light and heavy frosts were noted from the plateau region to the Ohio Valley. On the 6th the lowest temperature of the month occurred in Nebraska and southwest South Dakota, where it was 8° to 10° below freezing, and the first heavy frost of the season was noted at Valentine, Nebr. On the 7th the lowest temperature of the month occurred in east Kansas, Indian Territory, west Arkansas, and north Texas, and heavy frost was observed from Minnesota to north Texas.

III.—Appeared north of the Lake region on the 5th, and moving thence east-southeast disappeared off the Nova Scotia coast the night of the 7th, attended on the 6th by light and heavy frosts in the Lake region and Ohio Valley.

IV.—Was central over Alberta the morning of the 7th, whence it moved southeastward and disappeared over the middle Mississippi valley on the 10th by a decrease in pressure. On the 8th this area, in conjunction with number II, influenced the weather conditions over the Gulf States and Texas. At New Orleans, La., and Brownsville, Tex., the lowest temperature of the month was noted; in the west Gulf states and on the southeast slope of the Rocky Mountains the minimum temperature was 1° to 6° lower than previously re-

ported for the first decade of October; and the first light frost of the season was noted generally in the middle and west Gulf states. On the 9th this area was central over east Kansas, the lowest temperature of the month was noted at Dodge City, Kans., and the first light frost of the season occurred in east Tennessee and west North Carolina. The morning of the 10th a ridge of high pressure extended from the upper Ohio to the Rio Grande valleys; the lowest temperature of the month was noted at Galveston and Corpus Christi, Tex.; the first light frost of the season was reported in central Texas; and the first heavy frost of the season in northeast Texas and central Ohio.

V.—Appeared over the Saskatchewan Valley the evening of the 9th, and pursuing a normal east-southeast course disappeared off the New England coast the night of the 12th. On the 9th the first heavy frost of the season was reported at points in the upper Mississippi valley and at Grand Haven, Mich. On the 10th the temperature was below freezing in Manitoba, and the high area moved north of Lake Superior with pressure 30.70 at White River, Ont. During the 11th the pressure continued very high, with temperature below freezing over the north-central part of the Lake region. On the 12th the high area moved over the middle Saint Lawrence valley and east New England, with pressure above 30.70, and the first heavy frost of the season generally in the lower lake region, the middle and upper Ohio valleys, north Pennsylvania and New York, and at New Haven, Conn., and Eastport, Me. In Chautauqua and Tompkins counties, N. Y., the frost damaged grapes.

VI.—Was central off the Oregon coast on the 10th, moved thence to the Washington coast by the night of the 11th, thence southeastward to Colorado by the 14th, thence to the middle Atlantic coast by the 17th, and disappeared east of Nova Scotia during the 18th, its rate of advance, 26 miles per hour, being the highest noted for the month, and the same as number IX, which also traversed the continent. The morning of the 12th, when this area was central over east Washington, the lowest temperature of the month was reported at Roseburgh and Baker City, Oregon, the minimum at Baker City being 9° below freezing, and the first light frost of the season was noted at Roseburgh. On the 13th the area remained nearly stationary over the middle plateau, with frost in Washington, Colorado, and west South Dakota. On the 14th the center advanced to east Nebraska, the pressure was high from east Montana to the west Gulf coast, the lowest temperature of the month, 24°, was noted at Montrose, Colo., and frost was reported in Montana, Colorado, and Indian and Oklahoma territories. During the 15th the high area moved over the lower Ohio valley, with temperature below 20° in Manitoba and northern North Dakota, the lowest temperature of the month at points in the Missouri and Red River of the North valleys, and the first heavy frost of the season at stations in Missouri and southeast South Dakota. During the 16th the area moved slowly eastward over the upper Ohio valley, the first light frost of the season was reported at points in the east Gulf and south Atlantic states, and the first heavy frost at stations in West Virginia, Kentucky, Tennessee, and at Meridian, Miss. On the 17th the center passed off the New Jersey coast, the pressure was high from the lower Saint Lawrence valley to Florida, the first light frost of the season was reported at points in the east part of the middle and south Atlantic states, and the first heavy frost at Columbia, S. C., Pittsburg, Pa., and at stations in north West Virginia, east Maryland, west New Jersey, and in the interior of Connecticut. During the 18th this high area disappeared south of Newfoundland.

VII.—Appeared off the middle Pacific coast on the 16th, advanced to the lower Missouri valley by the 19th, and passing thence southeastward reached the east Gulf on the 21st. On the 18th, when the high area was central over the middle-eastern slope of the Rocky Mountains, frost was reported in Colorado. The morning of the 19th a ridge of high pressure

extended from Lake Superior to Texas, frost occurred on the southeast slope of the Rocky Mountains, and in the lower Mississippi valley, and the first heavy frost of the season was reported at Vicksburg, Miss. On the 20th the center occupied the middle Gulf coast, the lowest temperature of the month was noted at Shreveport, La., Rio Grande City, Tex., and Pensacola, Fla., the first light frost of the season was reported on the middle Gulf coast, and in south Alabama and south Georgia, and the first heavy frost of the season occurred at points in Louisiana, and at Cairo, Ill., Atlanta, Ga., in the cotton belt of Georgia, and at Raleigh, N. C. On the 21st this high area was central over the middle and east Gulf, the lowest temperature of the month, 58°, occurred at Port Eads, La., the first light frost of the season was noted at points in north Florida and South Carolina, and the first heavy frost of the season at Montgomery, Ala., and Augusta, Ga.

VIII.—Appeared over Alberta the evening of the 19th, and moving thence southeastward reached the east Gulf on the 24th. The morning of the 20th the pressure was high from the British Northwest Territory over the Rocky Mountain and plateau regions and thence to the Gulf of Mexico, and the evening of that date this high area was central over extreme northeast Montana. On the 21st the temperature fell below freezing in the upper Missouri and Red River of the North valleys. During the 22d the high area advanced to the middle Mississippi valley, the lowest temperature of the month was noted along the west shore of Lake Michigan and on the Mississippi River north of the 40th parallel, where it was 1° to 8° below freezing, and heavy frost was general in the middle and upper Mississippi and Missouri valleys. On the 23d the center advanced to the east Gulf states and the pressure was high from the Ohio to the Rio Grande valleys; the temperature was below freezing in east Ontario; the lowest temperature of the month was reported at points from west Michigan to the east Gulf states; the line of freezing weather extended to north Tennessee; and the minimum at Meridian, Miss., was 29°. The first heavy frost of the season was reported at Little Rock, Ark., and at points in central Louisiana, central and north Mississippi, south Georgia, and the Carolinas. During the 24th the center settled southward over the Gulf of Mexico; the lowest temperature of the month occurred in Florida, where the minimum ranged from 44° at Tampa to 67° at Key West; the first light frost of the season was reported in the interior of Florida to about the 28th parallel, and at Savannah, Ga.; and the first heavy frost at stations in the Carolinas. On this date a storm of great energy, low area VIII, was central over the Gulf of Saint Lawrence, the pressure was high north of the Lake region, and the first heavy frost of the season was reported on the Rhode Island coast. On the 25th the pressure was relatively high from the lower lakes to the Gulf of Mexico, the lowest temperature of the month was noted in western New York, where the minimum was 2° to 3° below freezing, and the first heavy frost of the season was reported at Boston, Mass., Harrisburg and Philadelphia, Pa., and Atlantic City, N. J.

IX.—Appeared off the middle Pacific coast on the 23d, passed thence to Utah by the 24th, thence to Manitoba by the 26th, and thence to the North Carolina coast by the 29th, its rate of progress, 26 miles per hour, being the greatest noted for the month, and the same as that of high area VI. The morning of the 25th this area was central over the middle plateau and the evening of that date a ridge of high pressure extended from Alberta over the Rocky Mountain and plateau regions and thence to the Gulf of Mexico. Reports of the 26th indicated that the center had shifted to Manitoba, and the morning of that date the temperature was below freezing in North Dakota and north Minnesota. On the 27th the area was central over the upper Mississippi valley, the minimum temperature fell to or below 32° southward to north Iowa and north Illinois, and the lowest temperature of the month was reported at points in the Red River of the North and middle Missouri valleys. During the 28th the center advanced southeast-

ward over the Ohio Valley, the temperature fell below 32° in east Ontario, the Saint Lawrence Valley, north New York, and north New England, the lowest temperature of the month was reported in Michigan, the middle and upper Ohio valleys, and on the Lake Ontario and south Atlantic coasts, and the first heavy frost of the season occurred at University, Miss., Lynchburgh, Va., and New York, N. Y. During the 29th the center passed off the North Carolina coast, the temperature fell below 32° over the greater part of New England and the Canadian Maritime Provinces, the lowest temperature of the month was noted at stations in the middle and south Atlantic and east Gulf states and New England, the first light frost of the season was reported at stations in north Florida, and the first heavy frost of the season at Wilmington, N. C., Washington, D. C., Baltimore, Md., along the south New England coast, and at other stations in the middle and south Atlantic states.

X.—Was central off the middle California coast the evening of the 28th, advanced northward during the 29th, and reached Alberta on the 30th, whence it moved eastward and at the close of the month was central over Assiniboia. On the 29th when this area was moving northward along the Pacific coast the temperature was below 20° in north Alberta. On the 30th, when the center had advanced to Alberta, the line of freezing weather extended to north Montana, the lowest temperature of the month was noted at Eureka and Sacramento, Cal., and Yuma, Ariz., and the first light frost of the season was reported at Red Bluff, Cal. On the 31st the pressure was high from the British Northwest Territory to the Gulf of Mexico, the temperature fell below 32° from Montana eastward over the north part of the Lake region, the lowest temperature of the month was noted at stations in Montana, east Washington, and east Colorado, and the first heavy frost of the season was reported at Olympia, Wash.

LOW AREAS.

The principal track of October low areas lies along the northern border of the country west of the 100th meridian, whence it crosses the Lake region and Saint Lawrence Valley; a less frequent course is from the middle plateau region to the Great Lakes and thence eastward; and low areas of pronounced strength, averaging about one per year, pass up the middle and south Atlantic coasts.

The paths of 10 low areas are charted for the month, the average number traced for October during the last 15 years being 11. With one exception the paths were confined to the extreme northern and eastern parts of the country, and the tracks converged toward New England and the Canadian Maritime Provinces. Five of the low areas advanced from the north Pacific coast, 4 of which traversed the country and reached the Canadian Maritime Provinces, one low area first appeared over the British Northwest Territory, one apparently developed over the plateau region, one over the Lake region, one in the Ohio Valley, and one on the middle Atlantic coast. From the 12th to 14th the heaviest gales of the month prevailed along the coast from south New England to the Carolinas under the influence of a low area which was central-off the coast. The low areas which traversed the western part of the north Atlantic Ocean and the cyclonic areas noted over the West Indies and Gulf of Mexico are given a description under "North Atlantic storms."

The following is a brief description of the low areas which appeared over the United States and Canada:

I.—The month opened with a trough of low pressure extending from Manitoba to Arizona, with two cyclonic centers, one in South Dakota and the other in western Colorado. The evening of the 1st the pressure was lowest over Nebraska. Moving northeast the center of disturbance passed north of Lake Superior during the 2d and thence eastward to the Gulf of Saint Lawrence by the night of the 3d. During the 1st and 2d this low area skirted the west margin of high area I which occupied New England and the middle Atlantic states, and with the southward movement of the high area during the 3d the low

area assumed a normal easterly course. Its advance was attended by a general increase in central pressure, and a warm wave over the central valleys, the Lake region, and the middle Atlantic and New England states.

II.—Apparently developed near the south end of Lake Michigan the evening of the 3d, moved northeastward during the 4th, and passing south of east from Ontario united the evening of the 5th with an ocean storm which had advanced to Nova Scotia from the southward. Attending the development of this low area on the 3d, excessive rainfall was reported in Wisconsin, and the decrease in pressure in 12 hours was .15 to .20 from the south part of Lake Michigan over the Ohio Valley and the south Atlantic states. The greatest energy was indicated the night of the 4-5th, when the pressure fell to 29.60 in east Ontario and west Quebec, and at Rockliffe, Ont., the decrease in pressure in 12 hours was .28 on the 4th. The warm wave noted in connection with low area I extended over the eastern part of the country, and the highest temperature of the month was noted generally in the Atlantic coast states from the 3d to 5th. On the 3d the rain area extended from the Lake region to Kansas, during the 4th it extended eastward to the west slope of the Alleghany Mountains, and on the 5th areas of rainfall appeared in the Atlantic coast states. It will be observed that throughout the course of this low area the attending area of rainfall extended southwestward from the center.

III.—From 8 a. m. to 8 p. m. of the 7th there was a decrease in pressure of .20 to .30 from Lake Ontario to the Virginia coast, and during the night of the 7-8th this low area apparently developed on the middle Atlantic coast, probably in Virginia. The morning of the 8th the storm-center was located off the Massachusetts coast, whence it moved northeastward and disappeared east of Newfoundland during the 9th. The night of the 7-8th excessive rainfall occurred in east Virginia, North Carolina, and the east Gulf states. At Birdsnest, Va., 6.85 inches of rain fell in 4 hours. During the 8th heavy rain and hard gales prevailed along the coast from the Carolinas northward. At Sydney, C. B. I., the greatest decrease in pressure in 12 hours noted for the month, .68, occurred from 8 a. m. to 8 p. m. of the 8th.

IV.—Appeared over Alberta the morning of the 10th, and following a normal south of east course reached the Gulf of Saint Lawrence the morning of the 16th, its average rate of advance, 18 miles per hour, being the least noted in connection with the low areas of the month. Rain fell on the north Pacific coast on the 10th. During the 11th the rain area extended eastward to the Dakotas. On this date the storm-center assumed the form of an ellipse, and in the evening extended southward over the Dakotas with a steep barometric gradient to the eastward in the rear of high area V. Wind velocities of 50 to 60 miles per hour were reported in the middle Missouri valley, and a velocity of 66 miles per hour was noted at Huron, S. Dak. During the 12th and early part of the 13th the center remained nearly stationary over Manitoba, its eastward advance being checked by high pressure to the eastward. On these dates the rain area extended eastward to the west part of the Lake region and southward to the Ohio Valley, and high winds prevailed in the middle Missouri valley and over the upper lakes. With the disappearance of high area V off the Nova Scotia coast during the 13th, this low area assumed a more rapid easterly course. During the 14th the rain area extended eastward over the lower lakes and the Ohio Valley, and high winds prevailed over the Lake region. On the 15th the center reached the lower Saint Lawrence valley, and rain fell in areas in the Lake region, the Saint Lawrence Valley, and along the New England and New Jersey coasts. The steep barometric gradient in advance of this low area prior to the 14th had the apparent effect of preventing the eastward extension of the rain area, and it was not until after the gradient had become less marked that rain fell to the eastward of the storm-center.

V.—Was central off the north Pacific coast the morning of

the 14th, moved to the British Northwest Territory, where it remained nearly stationary from the evening of the 14th to the morning of the 16th, thence to the west part of the lower lake region, where it remained nearly stationary from the night of the 18th to the night of the 19th, thence to the Massachusetts coast by the morning of the 20th, where it was joined by an area of low pressure which had advanced northeastward along the New Jersey coast during the night of the 19-20th, thence to eastern New York by the evening of the 20th, and thence northeastward to the Gulf of Saint Lawrence by the night of the 21st. On the 13th there was a marked rise in temperature on the north Pacific coast, the abnormal rise in 12 hours being 22° at Roseburgh, Oregon. On the 14th rain fell on the Pacific coast north of the 40th parallel and in the valley of the Columbia River, the wind reached a velocity of 61 miles per hour at Fort Canby, Wash., and at night the pressure fell to 29.40 in Alberta. Slight changes occurred in the position and character of this low area during the 15th. The barometric gradient to the eastward, which had been steep on the night of the 14th, became less marked with the eastward movement of high area VI, the main area extended to east Oregon and Washington, and there was an abnormal increase in temperature of 10° to 20° in 12 hours in the middle Missouri valley. From the 16th to 18th the center moved southeastward to Lake Erie. During the 17th an area of general rain extended from the upper lakes to the lower Ohio valley, and wind velocities of 20 to 40 miles per hour were reported over the upper lakes. From the night of the 18th to the night of the 19th the center remained nearly stationary near Lake Erie. On the 18th the rain area extended from Lake Erie southward to Georgia, and a heavy thunder and hail storm was reported in Indiana. The evening of the 19th a cyclonic area appeared over Chesapeake Bay, attended by heavy rain. By the morning of the 20th the two centers had united off the Massachusetts coast, and by the evening of that date the center of disturbance had moved to eastern New York, with unusually severe easterly to southerly gales on the New England coast, and rain from the Ohio Valley over New England. Passing thence northeastward the storm center disappeared over the Gulf of Saint Lawrence the night of the 21st without evidence of diminished energy. Similar to the slow-moving storms previously described for the current month, the rain attending this low area fell to the south and west of the center.

VI.—Appeared over the British Northwest Territory on the 18th, when high west to northwest winds were reported in northwest Washington, and passing thence east-southeast to the Lake region united with low area V on the 20th, its passage being unattended by noteworthy features.

VII.—Appeared on the north Pacific coast the morning of the 22d and moved thence to the British Northwest Territory, where it remained almost stationary until the morning of the 24th, after which it passed east-southeast and disappeared over Nova Scotia the night of the 26th. On the 22d rain fell on the Pacific coast north of San Francisco, Cal., and wind velocity of 58 miles per hour was reported at Fort Canby, Wash., and Winnemucca, Nev. During the 23d and 24th the rain area was confined to Washington and Oregon. On the 23d the highest temperature of the month was noted at stations in South Dakota, Nebraska, and Kansas, and the abnormal rise in temperature in 12 hours was 20° at Huron, S. Dak.

No rain, save light showers in the east part of the Lake region, attended this low area on the 25th. On the 26th rain fell from the Lake region to the New Jersey and New England coasts, heavy gales prevailed over the Lake region, and severe storms were reported in northern Ohio and western New York. The influence of this low area extended over the northeast sections during the 27th, when there was a decrease in pressure of .36 in 12 hours at Sydney, C. B. I., rain fell in areas east of the Lake region and Ohio Valley, and high winds prevailed along the Atlantic coast to the Carolinas.

VIII.—Apparently developed in the Ohio Valley the evening of the 21st, passed thence to the Virginia coast by the morning of the 22d, and moving thence northeastward reached the Gulf of Saint Lawrence the morning of the 24th. During the 21st there was a decrease in pressure of .10 to .20 in 12 hours from Ohio to the east Gulf and South Atlantic coasts, and there was an abnormal rise of 10° to 20° in temperature over that region for the period named. During the 22d the low area increased in energy, the rain area extended over the middle Atlantic states and south New England, and heavy gales reaching a velocity of 50 to over 60 miles per hour prevailed along the Atlantic coast from Nova Scotia to the Carolinas. During the 23d the center of disturbance advanced to the Nova Scotia coast with a marked decrease in pressure, the pressure fall in 12 hours being .66 at Sydney, C. B. I. On this date unusually severe gales prevailed along the New England, middle Atlantic, and North Carolina coasts, a velocity of 64 miles per hour from the north being reported at Block Island, R. I. By the morning of the 24th a further increase in energy was indicated, and the barometer reading at Sydney, C. B. I., 28.72, at 8 a. m., 75th meridian time, was the lowest noted during the month. The influence of this low area, in the form of high winds, was felt over New England until the 25th, but little rain was, however, reported after the 23d.

IX.—Appeared off the north Pacific coast on the 26th and passing thence east-northeast disappeared north of Manitoba during the 27th, its rate of advance, 39 miles per hour, being the greatest noted in connection with the low areas of the month. On the 26th rain fell on the north Pacific coast, the decrease in pressure in 12 hours was .60 in Alberta, and wind velocity exceeding 40 miles per hour was reported on the Washington coast. No rain attended this low area on the 27th; at stations in Montana, Wyoming, and Colorado the temperature was the highest noted for the month.

X.—Appeared on the north Pacific coast on the 28th and passing thence eastward was central over the Saint Lawrence Valley at the close of the month. On the 28th rain fell on the middle and north Pacific coasts and in the valley of the Columbia River, the decrease in pressure in 12 hours was .40 in Alberta, and at points in the middle Missouri valley the maximum temperature was the highest noted for the month. On the 29th the rain area extended to west Montana. On the 30th this low area showed a marked increase in energy, the barometric gradient to the west of the center was steep, the rain area extended to Minnesota, and heavy gales, with snow, were noted in the extreme northwest. On the 31st the rain area extended eastward to New England and southward to Tennessee, and heavy gales prevailed over the Great Lakes, a velocity of 61 miles per hour from the northwest, and an extreme velocity of 120 miles, being reported at Detroit, Mich.

Tabulated statement showing principal characteristics of areas of high and low pressure.

Barometer.	First observed.			Last observed.			Duration.	Velocity per hour.	Maximum pressure change and maximum abnormal temperature change in twelve hours and maximum wind velocity.											
	Date.	Lat. N.	Long. W.	Lat. N.	Long. W.				Station.	Rise.	Date.	Station.	Fall.	Date.	Station.	Direction.	Miles per hour.	Date.		
High areas.							Days.	Miles.		Inch.										
I.....	1	44	71	35	85	3-0	16		Sydney, C. B. I.....	.26	1	Augusta, Ga.....	12	1	Kitty Hawk, N. C.....	ne.	36	1		
II.....	3	44	125	35	83	5-0	22		Pueblo, Colo.....	.32	3	Concordia, Kans.....	29	2	Denver, Colo.....	n.	30			
III.....	5	50	86	46	83	2-0	25		Sydney, C. B. I.....	.54	6	Montreal, Quebec.....	13		Kitty Hawk, N. C.....	ne.	30	6-5		
IV.....	7	53	115	39	92	3-0	22		Medicine Hat, N. W. T.....	.30	7	Spokane Falls, Wash.....	17	5	Rapid City, S. Dak.....	nw.	35	7		
V.....	9	53	105	45	85	3-0	25		Portland, Me.....	.40	11	Kingston, Ont.....	18	11	Port Huron, Mich.....	ne.	32	11		
VI.....	11	43	124	44	85	7-0	26		Anticosti Island, G. St. L.....	.40	17	Pueblo, Colo.....	19	12	Eureka, Cal.....	n.	34	11		
VII.....	16	41	125	39	84	5-5	20		Calgary, N. W. T.....	.56	17	Winnemucca, Nev.....	22	15	Rio Grande City, Tex.....	n.	40	18		
VIII.....	19	53	114	39	87	5-0	20		do.....	.42	19	Rapid City, S. Dak.....	20	20	Tatoosh Island, Wash.....	e.	40	20		
XI.....	23	40	125	35	77	5-5	26		Cincinnati, Ohio.....	.46	27	Louisville, Ky.....	23	27	Chicago, Ill.....	ne.	46	27		
X.....	28	37	126	51	105	3-0	24		Saint Vincent, Minn.....	.74	31	Miles City, Mont.....	21	30	Fort Canby, Wash.....	se.	30	30		
Mean.....							4-2	23		.44			19					35		
Low areas.										Fall.			Rise.							
I.....	1	38	108	50	68	2-5	36		Quebec, Quebec.....	.30	2	Father Point, Quebec.....	16	3	Sioux City, Iowa.....	s.	46	2		
II.....	4	44	83	43	66	1-5	25		Rockliffe, Ont.....	.28	4	Yarmouth, N. S.....	13		Cairo, Ill.....	nw.	26	4		
III.....	8	42	70	48	54	1-0	36		Sydney, C. B. I.....	.68	8	Sydney, C. B. I.....	18		Kitty Hawk, N. C.....	n.	44	8		
IV.....	10	52	116	47	65	6-0	18		Manistee, Mich.....	.34	13	Grand Haven, Mich.....	17	13	Huron, S. Dak.....	se.	66	11		
V.....	14	51	114	49	64	7-0	23		Father Point, Quebec.....	.52	21	Roseburg, Oregon.....	22	13	Fort Canby, Wash.....	s.	61	14		
VI.....	19	53	106	49	88	1-5	33		Medicine Hat, N. W. T.....	.48	18	Valentine, Nebr.....	22	15	Saint Vincent, Minn.....	s.	36	19		
VII.....	22	48	126	45	68	4-5	30		Sydney, C. B. I.....	.36	27	Helena, Mont.....	20	19	Fort Canby, Wash.....	s.	58	22		
VIII.....	22	38	77	47	61	2-0	23		do.....	.66	23	Chattanooga, Tenn.....	24	21	Winnemucca, Nev.....	n.	64	22		
IX.....	26	47	125	53	106	1-0	39		Calgary, N. W. T.....	.60	26	Winnemucca, Nev.....	16	26	do.....	n.	64	23		
X.....	28	49	125	47	74	3-5	29		do.....	.40	28	Northfield, Vt.....	33	30	Fort Canby, Wash.....	s.	46	26		
Mean.....							3-0	29		.46			20					51		

NORTH ATLANTIC STORMS FOR OCTOBER, 1891 (pressure in inches and millimeters; wind-force by Beaufort scale).

The paths of storms that appeared over the west part of the north Atlantic Ocean during October, 1891, are shown on Chart I. These paths have been determined from observations by shipmasters received through the co-operation of the Hydrographic Office, Navy Department, and the "New York Herald Weather Service."

October usually marks the commencement of the stormy season in the middle latitudes of the north Atlantic Ocean. The north Atlantic area of high pressure contracts, the Iceland area of low pressure extends its limits southward, with a decrease in central pressure, and storms which advance from the west part of the north Atlantic or from the American continent have a comparatively unobstructed path to the middle and north coasts of Europe. Storms of tropical origin are not uncommon in October. West India cyclones of October generally appear over the Caribbean Sea and recurve over or near extreme western Cuba or the east part of the Gulf of Mexico. In the last 18 years 9 storms of marked energy have advanced northward from the Caribbean Sea in October.

The north Atlantic storms of the current month were exceptionally severe, more especially those of the first and second decades of the month. During the first decade a storm of tropical origin advanced from southeast of Bermuda and reached the Newfoundland coast the night of the 5th; cyclonic areas were noted over the east and west parts of the Gulf of Mexico; very heavy gales were encountered over mid-ocean; and unsettled and stormy weather prevailed over the British Isles. In the second decade two energetic storms of tropical origin traversed the western part of the ocean; exceptionally severe weather was encountered over mid-ocean during the first half of the decade; and destructive storms occurred over the British Isles. In the third decade a heavy storm passed along the middle Atlantic and New England coasts and thence over the Canadian Maritime Provinces. Over the middle and eastern parts of the ocean the weather was comparatively settled after the 20th.

On the 1st a storm of considerable energy was central north-east of the Windward Islands, whence it moved northwest-

ward and the morning of the 4th was central west of Bermuda. During the 4th and 5th the path recurved to the north and northeast. The center of disturbance reached Nova Scotia the night of the 5th, and moving thence east-northeast apparently joined the Iceland area of low pressure by the 8th. This storm passed south of Bermuda the night of the 3d-4th, attended by heavy north-northeast to east and south gales, and pressure falling to 28.97 (736) at 8 p. m. of the 3d at Bermuda. Gales of force 10 to 11 attended the recurve of this storm to the northeast, and during the 7th and 8th, when central over mid-ocean, the pressure fell below 29.00 (737), and terrific gales were encountered along the trans-Atlantic steamship routes.

On the 1st a dispatch was received from Havana, Cuba, stating that a slight disturbance was seemingly developing to the southwest. During the next four days a cyclonic disturbance was indicated over the west part of the Gulf of Mexico. On the 6th a cyclonic area was apparently central south of western Cuba; by the 7th this storm had reached southern Florida, moving northeastward. Moving slowly northeastward off the Atlantic coast, the center reached Nova Scotia on the 14th, and moving thence east-northeast, was central south of Iceland on the 18th, and probably passed thence to the British Isles by the 21st. On the 11th, when central off Hatteras, this storm was apparently joined by a cyclonic area from the east part of the Gulf of Mexico. From the 11th to the 14th the passage of this storm was attended by the heaviest gales of the month along the middle Atlantic and New England coasts, and at points from the Carolinas to the southeast New England coast the maximum wind velocity exceeded 70 miles per hour, causing disasters to shipping and damage to property. The very high winds reported are a notable feature of this storm, inasmuch as the barometric depression was slight, the lowest reading being about 29.50 (749) the morning of the 14th. The barometric gradient was, however, very steep to the northward of the center during the 13th and 14th.

On the 5th and 6th the pressure fell below 29.00 (737) in a cyclonic area west of the British Isles, and on the 6th destructive gales prevailed over Ireland and along the west and south

coasts of Great Britain. The Bermuda storm above referred to apparently united with this low area by the 8th. Under the influence of the Iceland area of low pressure, which had apparently assumed a position more to the eastward than usual, and of areas of low pressure which advanced from the ocean, low pressure and stormy weather continued over the British Isles until the 23d. On the 13th and 14th immense damage was caused to coast and inland property in England, Ireland, and the south of Scotland, and gales of destructive violence continued during the 15th and 16th.

The presence of a cyclonic area over the east part of the Caribbean Sea was indicated by reports of the 13th to 15th. During the 15th the path apparently recurved northward over or near San Domingo, and the morning of the 17th the center was located east of the Bahamas, whence it moved north-northeast and reached the south coast of Newfoundland on the 20th. On the 17th gales of hurricane force were encountered east-northeast of the Bahamas. The night of the 17th a strong southeast gale set in at Bermuda. On the 18th, at 10 a. m., the barometer fell to 29.30 (744) at Bermuda, and during the day the wind was southeast to southwest and reached force 11, causing considerable damage. The storm-center passed west of Bermuda about 7 p. m. of the 18th. During the 19th there was an apparent decrease in energy, and during the 20th the path recurved westward and the storm united with low area V, which was moving down the Saint Lawrence Valley.

On the 25th low area VIII had advanced north of Newfoundland, and on the 28th low area VII had reached the east Newfoundland coast, whence it apparently moved eastward to mid-ocean by the close of the month.

FOG IN OCTOBER.

The limits of fog belts west of the 40th meridian, as determined from reports of shipmasters, are shown on Chart I by dotted shading. Near the Banks of Newfoundland fog was reported on 9 dates; and between the 55th and 65th meridians on 2 dates. No fog was reported by shipmasters west of the 65th meridian. Compared with the corresponding month of

the last 4 years the dates of occurrence of fog near the Grand Banks numbered 5 less than the average, and between the 55th and 65th meridians 2 less than the average. West of the 65th meridian the average number of dates for which fog has been reported in October during the last 4 years is 3. Dense fog was reported at stations along the New England and New York coasts from the 3d to 5th. The fog reported west of the 40th meridian and at Weather Bureau stations on the New England and New York coasts attended the approach or passage of general storms.

OCEAN ICE IN OCTOBER.

The following table shows the southern and eastern limits of the region within which icebergs or field ice were reported for October during the last 9 years:

Southern limit.			Eastern limit.		
Month.	Lat. N.	Long. W.	Month.	Lat. N.	Long. W.
October, 1883.....	46 56	46 22	October, 1883.....	46 56	46 22
October, 1884.....	Off Cape Race		October, 1884.....	46 56	50 55
October, 1885.....	48 21	47 12	October, 1885.....	46 21	47 12
October, 1886.....	41 34	49 43	October, 1886.....	46 03	46 37
October, 1887.....	42 58	50 02	October, 1887.....	42 58	50 02
October, 1888.....	51 43	55 36	October, 1888.....	51 43	55 36
October, 1889.....	44 32	49 28	October, 1889.....	46 30	45 59
October, 1890.....	44 47	49 33	October, 1890.....	47 56	45 45
October, 1891.....	48 04	48 27	October, 1891.....	48 04	48 27
Mean	46 09	49 56	Mean	47 16	48 33

The southernmost and eastermost ice reported was one iceberg, noted on the 3d in the position given in the table. This was the only date for which ice was reported south of the 50th parallel. Icebergs were reported in or east of the Straits of Belle Isle on the 5th, 6th, 11th, 12th, and 25th. The quantity of Arctic ice reported was notably deficient when compared with that observed for October during the last 9 years. The positions of icebergs reported for the current month are shown on Chart I by ruled shading.

TEMPERATURE OF THE AIR (expressed in degrees, Fahrenheit).

Many of the voluntary stations do not have standard thermometers or shelters.

The distribution of mean temperature over the United States and Canada for October, 1891, is exhibited on Chart II by dotted isotherms. In the table of miscellaneous meteorological data the monthly mean temperature and the departure from the normal are given for regular stations of the Weather Bureau. The figures opposite the names of the geographical districts in the columns for mean temperature and departure from the normal show, respectively, the average for the several districts. The normal for any district may be found by adding the departure to the current mean when the departure is below the normal and subtracting when above. The monthly mean temperature for regular stations of the Weather Bureau represents the mean of the maximum and minimum temperatures.

The mean temperature was highest at stations in the Colorado Desert in the east part of San Diego county, Cal., where it was above 80, and the mean values were above 70 over the southern half of the Florida Peninsula, in extreme southern Louisiana, in the lower Rio Grande valley, and in adjoining parts of southeastern California and western Arizona. The mean temperature was lowest in the mountains of Colorado and over the greater part of Canada east of the 115th meridian, where it was below 40, and the mean readings were below 50 north of a line traced from the middle New England coast

westward to the eastern slope of the Rocky Mountains, thence southward to central New Mexico, and thence irregularly northwestward to northeast Washington. The mean temperature was also below 50 at stations on the Central Pacific Railway crossing the summit of the Sierra Nevada Mountains in California.

DEPARTURES FROM NORMAL TEMPERATURE.

The mean temperature was generally above the normal on the Pacific coast, over the plateau and Rocky Mountain regions, and from the middle and upper Missouri valleys eastward over the west and north parts of the Lake region to the Saint Lawrence Valley. Along the Atlantic coast from Nova Scotia to Florida and thence westward to Kansas and Texas the mean temperature was below the normal.

The greatest departure above the normal temperature occurred at stations in the west part of the plateau region, on the north Pacific coast, and in northern California, where it was 2 to 4, and the most marked departure below the normal temperature was noted along the south Atlantic and east Gulf coasts, where it exceeded 4.

DEVIATIONS FROM NORMAL TEMPERATURE.

The following table shows for certain stations, as reported by voluntary observers, (1) the normal temperature for October for a series of years; (2) the length of record during which the observations have been taken, and from which the normal has been computed; (3) the mean temperature for October, 1891; (4) the departure of the current month from the normal;

(5) and the extreme monthly mean for October during the period of observation and the years of occurrence:

State and station.	County.	(1) Normal for the month of Oct.	(2) Length of record.	(3) Mean for Oct., 1891.	(4) Departure from normal.	(5) Extreme monthly mean for October.			
						Highest.	Year.	Lowest.	Year.
<i>Arkansas.</i>		°	<i>Years</i>	°	°	°		°	
Lead Hill	Boone	60.1	10	.....	.....	64.0	1881	56.0	1885
<i>California.</i>									
Sacramento	Sacramento	61.3	38	53.4	- 6.1	69.9	1875	53.9	1890
<i>Connecticut.</i>									
Middletown	Middlesex	50.0	24	49.3	- 0.7	54.7	1871	45.5	1888
<i>Florida.</i>									
Merritts Island	Brevard	75.7	9	72.9	- 2.8	79.0	1882	72.9	1891
<i>Georgia.</i>									
Forayth	Monroe	67.1	17	64.4	- 2.7	75.4	1884	61.7	1885
<i>Illinois.</i>									
Peoria	Peoria	53.9	32	54.3	+ 0.4	62.7	1879	45.2	1869
Riley	McHenry	47.9	35	49.4	+ 1.5	56.0	1879	38.6	1869
<i>Indiana.</i>									
Vevay	Switzerland	55.9	25	54.2	- 1.7	65.0	1879	43.2	1869
<i>Iowa.</i>									
Cresco	Howard	45.8	19	46.2	+ 0.4	54.1	1879	41.2	1873
Monticello .....	.....	49.0	36	48.8	- 0.2	58.0	1879	36.0	1873
Logan	Harrison	52.7	17	54.0	+ 1.3	60.7	1879	48.5	1875
<i>Kansas.</i>									
Lawrence	Douglas	54.4	23	54.1	- 0.3	60.5	1879	44.0	1869
Wellington	Sumner	56.9	12	.....	.....	60.6	1879, '84	53.3	1880, '83
<i>Louisiana.</i>									
Grand Coteau	Saint Landry	68.5	10	63.4	- 5.1	75.5	1883	63.4	1891
<i>Maine.</i>									
Orono	Penobscot	45.6	21	45.4	- 0.2	49.7	1879	42.1	1888
<i>Maryland.</i>									
Cumberland	Allegany	50.9	32	51.5	+ 0.6	60.0	1881	41.8	1869
<i>Massachusetts.</i>									
Amherst	Hampshire	48.8	55	48.6	- 0.2	56.0	1879	42.8	1841
Newburyport	Essex	49.3	13	49.2	- 0.1	55.0	1879	45.1	1888
Somerset	Bristol	52.4	19	52.6	+ 0.2	58.1	1879	47.6	1874
<i>Michigan.</i>									
Kalamazoo	Kalamazoo	49.9	15	51.9	+ 2.0	54.5	1879	45.7	1887
Thornville	Lapeer	50.4	14	49.7	- 0.7	58.5	1879	45.6	1889
<i>Minnesota.</i>									
Minneapolis	Hennepin	45.3	26	46.7	+ 1.4	56.1	1879	36.5	1869
<i>Montana.</i>									
Fort Custer	Custer	46.7	12	55.0	+ 8.3	55.0	1891	42.2	1883
<i>New Hampshire.</i>									
Hanover	Grafton	44.9	56	46.4	+ 1.5	52.4	1879	38.6	1836
<i>New Jersey.</i>									
Moorestown	Burlington	53.4	28	52.7	- 0.7	59.5	1879	48.6	1888
South Orange	Essex	52.7	21	50.7	- 2.0	58.1	1879	47.2	1871
<i>New York.</i>									
Cooperstown	Otsego	46.4	37	45.1	- 1.3	53.3	1879	40.7	1865
Palermo	Oswego	47.3	31	46.8	- 0.5	53.9	1879	41.6	1889
<i>North Carolina.</i>									
Lenoir	Caldwell	56.6	20	52.6	- 4.0	66.4	1878	48.0	1874
<i>Ohio.</i>									
N'th Lewisburgh	Champaign	51.9	59	52.2	+ 0.3	58.0	1852	43.0	1869
Wauseon	Fulton	50.4	21	49.0	- 1.4	59.0	1879	45.2	1889
<i>Oregon.</i>									
Albany	Linn	52.1	11	54.0	+ 1.9	56.3	1885	48.7	1881
Eola	Polk	51.5	20	54.2	+ 2.7	59.7	1876	45.4	1873
<i>Pennsylvania.</i>									
Dyberry	Wayne	46.5	23	44.1	- 2.4	53.4	1879	41.2	1869
Grampian Hills	Clearfield	47.7	27	46.1	- 1.6	50.4	1879	39.2	1869
Wellsborough	Tioga	49.9	12	44.4	- 5.5	60.0	1880	41.2	1889
<i>South Carolina.</i>									
Statesburgh	Sumter	63.4	10	58.7	- 4.7	69.0	1881	58.7	1891
<i>Tennessee.</i>									
Austin	Wilson	59.4	22	57.2	- 2.2	70.2	1879	52.5	1888
<i>Texas.</i>									
New Ulm	Austin	69.7	18	69.0	- 0.7	73.9	1881	65.8	1873
<i>Vermont.</i>									
Stratford	Orange	46.7	18	46.6	- 0.1	52.8	1879	40.6	1888
<i>Virginia.</i>									
Birdsneat	Northampton	60.8	23	58.0	- 2.8	69.2	1881	54.5	1869
<i>Washington.</i>									
Fort Townsend	Jefferson	50.5	15	51.4	+ 0.9	54.6	1875	48.6	1879
<i>Wisconsin.</i>									
Madison	Dane	47.9	22	45.4	- 2.5	59.4	1864	39.8	1869

YEARS OF HIGHEST MEAN TEMPERATURE FOR OCTOBER.

At stations in southern Montana, southeastern Washington, and on the north Pacific coast the mean temperature for the current month was the highest ever reported for October. At Fort Custer, Mont., and Port Angeles, Wash., the mean was 4.2 and 0.4, respectively, above the highest mean previously reported for the month, noted in 1889, and at Roseburgh, Oregon, and Walla Walla, Wash., the mean was 1.6 and 0.7, respectively, above that of 1888. The highest mean temperature for October occurred generally from the north Pacific coast to western North Dakota in 1889; along the middle Pacific coast in 1887; in the Red River of the North Valley in 1886; from the east Gulf coast over the interior of the south Atlantic states and eastern Tennessee in 1884; in the lower Mississippi valley in 1883; along the Atlantic coast south of

the 40th parallel in 1881; and from the lower Missouri and upper Mississippi valleys over the Lake region, the Ohio Valley, New York, and New England in 1879.

YEARS OF LOWEST MEAN TEMPERATURE FOR OCTOBER.

At stations in the south Atlantic and east Gulf states and Florida the mean temperature for the current month was the lowest ever reported for October by amounts varying from 0.2 at Key West, Fla., to 1.8 at Auburn, Ala. The lowest mean temperature for October occurred generally in New York and New England in 1888; in the north central valleys and Texas in 1887; on the south Pacific coast in 1886; from eastern Kansas to Louisiana in 1885; over the middle plateau and the west part of the southern plateau in 1883; from the middle Pacific coast over the northeast slope of the Rocky Mountains in 1881; along the Atlantic coast south of the 40th parallel, and in eastern Michigan and the upper Ohio valley in 1876; and in the middle Mississippi, lower Ohio, and lower Missouri valleys in 1873.

In 1887, when the mean temperature was the highest noted for October on the middle Pacific coast, it was the lowest reported for that month in north-central and south-central parts of the country. In 1886, when it was the highest in the Red River of the North Valley, it was the lowest on the south Pacific coast. In 1881, when it was the highest along the Atlantic coast south of the 40th parallel, it was the lowest from the middle Pacific coast over the northeast slope of the Rocky Mountains.

TEMPERATURE, JANUARY TO OCTOBER.

For the period January to October, 1891, inclusive, the temperature averaged about normal in the middle and south Atlantic and east Gulf states, the Rio Grande, upper Mississippi, and Missouri valleys, the Ohio Valley and Tennessee, and along the Pacific coast. In the upper lake region, the extreme northwest, and over the northern plateau the temperature averaged from 1 to 2, and in New England and the lower lake region it was about 1 in excess of the normal. At Key West, Fla., on the middle-eastern slope of the Rocky Mountains, and over the middle plateau there was a deficiency of 1 to 2, and in the west Gulf states, on the northeast and southeast slopes of the Rocky Mountains, and over the southern plateau there was a deficiency of about 1 for the period named.

MAXIMUM TEMPERATURE.

At stations on the north Pacific coast, in the upper Mississippi and lower Missouri valleys, and the Lake region, and along the south New England and New Jersey coasts the maximum temperature was the highest ever reported for October by amounts varying from 1 to 4.

The maximum temperature was above 100 in the lower Gila and lower Colorado valleys, and was above 90 in the San Joaquin and Sacramento valleys, and at points from the middle and southeast slopes of the Rocky Mountains eastward to the Atlantic coast. The lowest maximum temperature was noted on the extreme north Pacific and extreme east and southeast New England coasts, where it was below 70.

MINIMUM TEMPERATURE.

At stations on the east and south New England coasts the minimum temperature was as low or lower than previously reported for October.

The minimum temperature was below 10 in the mountains of central Colorado, and was below 20 in northern New England, parts of eastern New York and northeastern Pennsylvania, on the northeast slope of the Rocky Mountains, over the greater part of the plateau region north of the 35th parallel, and in the higher Sierra Nevada Mountains in northeast California. The highest minimum temperature was noted over southern Florida, where it was above 60, and the minimum temperature was 50 or above in southern California, southwest Arizona, and along the west coast of the Gulf of Mexico.

LIMITS OF FREEZING WEATHER.

The southern limit of freezing weather is shown on Chart V by a line traced from the south New England coast southwestward to central Georgia, thence northward to eastern Tennessee, thence southward to southern Alabama, thence to southern Mississippi, thence northward east of the Mississippi River to central Illinois, thence to Oklahoma Territory, and thence over central Arizona, and the western limit is shown by this line continued northwestward over southern Nevada to east-central California, and thence northward, describing a curve to the eastward over the valley of the Columbia River, to British Columbia.

RANGES OF TEMPERATURE.

The greatest daily ranges of temperature are shown in the table of miscellaneous meteorological data. The greatest monthly ranges occurred in areas from the middle and northern plateau regions to New England, where they exceeded 60, whence they decreased to less than 40 on the southeast New England coast, to less than 20 in extreme southern Florida, to less than 30 on the east Gulf coast, and on the south and middle Pacific coasts, and to less than 30 on the north Pacific coast.

PERIODS OF HIGH TEMPERATURE.

On the 1st and 2d a warm wave, with the highest temperature ever recorded for October in the upper Mississippi valley and the west part of the Lake region, overspread the central valleys, whence it extended to the Atlantic coast, where the highest temperature of the month was noted from the 3d to the 5th. The highest temperature ever reported for October occurred at points in New York on the 4th, and on the New Jersey coast on the 5th. On the 7th the highest temperature on record for October occurred on the north Pacific coast. During the 7th and 8th the warm wave extended over the central valleys of California, and during the 8th and 9th over the west part of the plateau region from Idaho to Arizona. This warm wave was preceded on the 3d and 4th by the highest temperature of the month on the immediate middle and south Pacific coasts. From the Mississippi River to the Rocky Mountains the warmest weather was generally noted during the third decade of the month.

PERIODS OF LOW TEMPERATURE.

The lowest temperature of the month was noted on the north Pacific coast on the 1st, and the cool wave extended thence over the plateau region during the 2d and 3d. On the 6th the lowest temperature of the month occurred at points in the east part of the southern plateau and on the eastern slope of the Rocky Mountains, and by the 7th the cool wave had extended to Kansas, Indian Territory, and Texas, with temperature below freezing north of the 35th parallel, and by the 8th the cooler weather had reached the west Gulf coast, where the temperature continued low during the next three days, with the lowest readings of the month, and the lowest minimum temperature ever noted for the first decade of October. Cool weather prevailed over the central valleys and the middle Gulf states on the 20th. On the 22d and 23d the lowest temperature of the month occurred from the upper lake region to the middle Gulf coast, and the temperature fell below freezing in south and east Mississippi and west Alabama. By the 24th the cool wave had extended over the Florida Peninsula, where the lowest temperature of the month was noted, and the lowest minimum values of the month were reported in the east lower lake region on the 25th. During the 28th and 29th a cool wave overspread the country from New England to the east Gulf states; over the greater part of this region the lowest temperature of the month was noted on those dates, the line of freezing weather extended to central Georgia, and at stations on the east and south New England coasts the minimum temperature was as low or lower than previously reported for October.

FROST.

The first heavy frost of the season was reported as fol-

lows: 1st, Northfield, Vt.; at points in south New Hampshire, central Massachusetts, and central Pennsylvania; Carson City, Nev.; Walla Walla, Wash. 2d, Nordhoff, Ventura Co., Cal.; Montrose, Colo. 3d, Tucson, Ariz.; Salt Lake City, Utah; Rapid City, N. Dak. 4th, Santa Fé, N. Mex.; Denver and Pueblo Colo.; Wichita, Salina, and Wakefield, Kans.; North Platte, Nebr.; Alta and Storm Lake, Iowa. 5th, Springfield and Riley, Ill.; Manistee, Mich. 6th, Valentine, Nebr.; Larrabee, Iowa; Green Bay, Wis.; Alpena, Mich.; Indianapolis, Ind. 7th, Dodge City, Concordia, Kansas City, Leavenworth, Globe, and Independence, Kans.; Oklahoma, Okla. T.; Healdton, Ind. T.; Hampton, Iowa; Fort Smith, Ark.; Duluth, Saint Paul, and Minneapolis, Minn. 8th, Paragould, Ark.; Aberdeen, Miss. 9th, La Crosse, Wis.; Red Wing, Minn.; Davenport, Iowa; Grand Haven, Mich.; Oswego, N. Y.; Aqueduct, Pa. 10th, Manchester, N. H.; Dubuque, Iowa; Mesquite, Tex.; Gratiot, Westerville, and Lordstown, Ohio. 11th, Marquette, Mich. 12th, Eastport, Me.; Williamstown, Mass.; New Haven, Conn.; Albany, Lowville, Ithaca, Rochester, and Buffalo, N. Y.; Erie, Edinborough, and Le Roy, Pa.; Port Huron, Mich.; Cincinnati, Columbus, Cleveland, Garrettsville, andiffin, Ohio. 13th, Detroit, Mich.; Toledo and Sandusky, Ohio. 14th, Staunton, Va. 15th, Wytheville, Va.; Palestine, Ill.; Lebanon, Withers Mills, Saint Louis, and Columbia, Mo.; Vevay, Ind.; Yankton, S. Dak. 16th, Voluntown, Conn.; Dale Enterprise, Marion, Big Stone Gap, and Lexington, Va.; Parkersburg, W. Va.; Talladega, Ala.; Louisville, Ky.; Knoxville, Chattanooga, Nashville, and Riddleton, Tenn.; Meridian, Miss.; Oswego, Charleston, and Sycamore, Ill.; Cedar Rapids, Clinton, and McCausland, Iowa; Harvey and Waukesha, Wis.

17th, Southington, Conn.; Beverly, N. J.; Pittsburg, Pa.; Woodstock, Md.; Buckhannon, W. Va.; Columbia, S. C.; Mount Pleasant, N. C.; Paducah, Ky.; North Lewisburgh, Ohio. 18th, Abilene, Kans. 19th, Vicksburg, Miss. 20th, Charlotte, N. C.; Atlanta, Cordele, and Forsyth, Ga.; Brownsville, Tenn.; Cairo and Olney, Ill.; Keokuk, Iowa; Warrenton, Mo.; Conway, Ark.; Shreveport, Cheneyville, and Liberty Hill, La. 21st, Augusta, Ga.; Montgomery, Ala. 22d, Amana, Iowa. 23d, Petersburg and Richmond, Va.; Raleigh, Oak Ridge, and Wadeville, N. C.; Statesburgh and Tillers Ferry, S. C.; Poulan and Albany, Ga.; Bermuda, Ala.; Agricultural College, Water Valley, and Yazoo City, Miss.; Memphis, Tenn.; Jacksonborough, Ohio; Little Rock, Stuttgart, Lonoke, and Osceola, Ark.; Alexandria and Marksville, La. 24th, Fall River, Royalston, Vineyard Haven, and Somerset, Mass.; Narragansett Pier, R. I.; Spottsville, Va.; Lumberton, Wadesborough, and Weldon, N. C.; Cheraw and Effingham, S. C. 25th, Boston, Mass.; Atlantic City, New Brunswick, Egg Harbor City, and Moorestown, N. J.; Harrisburg and Philadelphia, Pa. 26th, Kingston, Tenn. 28th, New York, N. Y.; Lynchburgh and Nottaway O. H., Va.; Glenville, W. Va.; Goldsborough, N. C.; University, Miss.; Manton, Mich. 29th, Cambridge, Woods Holl, and New Bedford, Mass.; Block Island, R. I.; New London, Conn.; Dover, Del.; Baltimore, Md.; Washington, D. C.; Cape Charles, Stanardsville, Norfolk, Birdsnest, Mossing Ford, and Salem, Va.; Wilmington, Lenoir, New Berne, and Lewisburgh, N. C.; Jacksonborough and Hardeeville, S. C.; Americus and Thomasville, Ga. 31st, Olympia, Wash.

Heavy frost occurred in the interior of the west Gulf states from the 19th to 23d, and in the interior of the east Gulf and south Atlantic states at intervals during the third decade of the month. Light frost was reported in north part of the Florida Peninsula from the 20th to 24th, and on the 24th it was noted as far south as Pasadena, Pasco Co., Fla.

The occurrence of heavy frost in the south part of the Gulf States is unusual in October, the average date of first killing frost in that region being from November 1st to 15th. In the Carolinas the heavy frost of the current month was about seasonable.

PRECIPITATION (expressed in inches and hundredths).

The distribution of precipitation over the United States and Canada, for October, 1891, as determined from the reports of nearly 2,000 stations, is exhibited on Chart III. In the table of miscellaneous meteorological data the total precipitation and the departure from the normal are given for regular stations of the Weather Bureau. The figures opposite the names of the geographical districts in the columns for precipitation and departure from the normal show, respectively, the averages for the several districts. The normal for any district may be found by adding the departure to the current mean when the precipitation is below the normal and subtracting when above.

In October the monthly precipitation is usually greatest along the immediate north Pacific and east Florida coasts, where it exceeds 6.00; on the west Gulf coast, in an area extending from east-central Wisconsin over the north part of lower Michigan, along the immediate New England coast, and over Nova Scotia it averages more than 4.00; and east of a line traced from Minnesota to the middle Rio Grande valley the monthly rainfall generally exceeds 2.00. Over the greater part of the Rocky Mountain and plateau regions and in central and southern California less than 1.00 falls, and an almost entire absence of rainfall over the south part of the southern plateau and southern California is not unusual in October.

For October, 1891, monthly precipitation to exceed 10.00 was reported in extreme eastern Nova Scotia, and on the Massachusetts, Virginia, and extreme northwest Washington coasts; and at Cape Mendocino, Cal., a monthly amount of 10.00 was noted. At points along the Atlantic coast from Nova Scotia to southern Florida, and on the Oregon and Washington coasts 4.00 to 8.00 was recorded. Over the greater part of the southern plateau region west of New Mexico no precipitation was reported, and generally over the middle and southern plateau regions and in the interior of the east and west Gulf states less than 0.25 fell.

DEPARTURES FROM NORMAL PRECIPITATION.

The monthly precipitation was deficient, except along the immediate Atlantic coast from North Carolina to the Gulf of Saint Lawrence, over southern Florida, from central and southern Kansas over eastern Nebraska, on the northeast slope of the Rocky Mountains, and along the north Pacific coast. From the Lake region to the Gulf of Mexico the monthly precipitation was 2.00, or more, deficient. Along the middle Atlantic and south New England coasts, in Nova Scotia, at stations in central Kansas and eastern Nebraska it was 2.00, or more, and on the Nova Scotia coast it was more than 4.00 in excess of the normal amount for October.

Considered by districts the average percentage of the normal in districts where the precipitation was in excess was about as follows: middle-eastern slope, 210; New England and northeast slope, 130; Key West, Fla., 120; north Pacific coast, 110; extreme northwest, 106. In districts where the precipitation was deficient the percentage of the normal was about as follows: south Pacific coast, 3; southern plateau, 6; southeast slope, 14; east and west Gulf states, 18; middle Pacific coast, 20; northern plateau, 30; Ohio Valley and Tennessee, upper lake region, and middle plateau, 40; upper Mississippi valley, 50; Rio Grande Valley, 66; lower lake region, 70; and Missouri Valley, 90. In the middle and south Atlantic states the monthly precipitation averaged about normal.

PRECIPITATION, JANUARY TO OCTOBER.

For the period January to October the precipitation averaged about normal in New England, at Key West, Fla., over the middle and northern plateau regions, and on the north and middle Pacific coasts. In the middle Atlantic states, the extreme northwest, and on the northeast and middle-eastern slopes of the Rocky Mountains the precipitation was one-tenth to three-tenths greater than usual, and in the south Atlantic and Gulf states, the Rio Grande, upper Mississippi, and Missouri valleys, the Ohio Valley and Tennessee, the Lake region,

the southeast slope of the Rocky Mountains, the southern plateau region, and on the south Pacific coast it was seven-tenths to nine-tenths of the normal amount for the period named.

DEVIATIONS FROM AVERAGE PRECIPITATION.

The following table shows for certain stations, as reported by voluntary observers, (1) the average precipitation for October for a series of years; (2) the length of record during which the observations have been taken and from which the average has been computed; (3) the total precipitation for October, 1891; (4) the departure of the current month from the average; (5) and the extremes for October during the period of observation and the years of occurrence:

State and station.	County.	(1) Average for the month of Oct.	(2) Length of record.	(3) Total for Oct., 1891.	(4) Departure from average.	(5) Extremes for Oct.			
						Greatest.		Least.	
						Am't.	Year.	Am't.	Year.
Arkansas.		Inches	Years	Inches	Inches.	Inches.		Inches	
Lead Hill.....	Boone.....	4.46	10	0.93	-3.53	18.11	1883	0.10	1886
California.									
Sacramento.....	Sacramento.....	0.79	55	0.16	-0.63	7.01	1889	0.00	*
Connecticut.									
Middletown.....	Middlesex.....	4.03	30	4.24	+0.21	14.51	1869	0.89	1868
Florida.									
Merritts Island..	Brevard.....	5.59	13	5.39	-0.20	11.94	1886	1.33	1889
Georgia.									
Forsyth.....	Monroe.....	3.00	17	T.	-3.00	7.86	1879	T.	1891
Illinois.									
Peoria.....	Peoria.....	2.66	35	0.71	-1.95	5.68	1877	0.70	1860
Riley.....	McHenry....	2.74	40	1.16	-1.58	6.81	1881	0.29	1867
Indiana.									
Logansport.....	Cass.....	2.84	15	1.29	-1.55	5.47	1881	1.00	1889
Vevay.....	Switzerland..	2.57	26	0.28	-2.29	7.67	1883	0.28	79, '91
Iowa.									
Cresco.....	Howard.....	2.37	20	1.95	-0.42	8.06	1881	0.13	1889
Monticello.....	Jones.....	2.95	36	2.16	-0.79	7.21	1881	0.43	1872
Logan.....	Harrison....	2.54	23	5.64	+3.10	6.60	1881	0.46	1889
Kansas.									
Lawrence.....	Douglas.....	2.91	25	1.35	-1.56	6.96	1870	0.44	1875
Wellington.....	Sumner.....	3.39	12	.....	.....	6.32	1882	1.29	1886
Louisiana.									
Grand Coteau....	St. Landry..	2.66	8	1.38	-1.28	4.98	1890	T.	1889
Maine.									
Orono.....	Penobscot...	4.26	21	2.85	-1.41	7.51	1888	1.09	1882
Maryland.									
Cumberland.....	Allegany....	2.44	20	2.21	-0.23	6.65	1890	0.00	1879
Massachusetts.									
Amherst.....	Hampshire..	3.97	56	2.81	-1.16	11.36	1869	1.12	1876
Newburyport....	Essex.....	3.94	13	4.32	+0.38	7.20	1890	0.81	1879
Somerset.....	Bristol.....	4.12	19	4.37	+0.25	9.61	1890	1.17	1879
Michigan.									
Kalamazoo.....	Kalamazoo..	3.02	15	0.97	-2.05	6.57	1881	0.97	1891
Thornville.....	Lapeer.....	3.26	14	3.26	0.00	7.96	1890	1.28	1889
Minnesota.									
Minneapolis.....	Hennepin....	1.95	25	1.84	-0.11	4.92	1868	0.06	1889
Montana.									
Fort Custer.....	Custer.....	1.01	12	4.60	+3.59	4.60	1891	0.24	1885
New Hampshire.									
Hanover.....	Grafton.....	3.45	50	1.50	-1.95	9.24	1869	0.32	1868
New Jersey.									
Moorestown.....	Burlington..	3.38	28	2.80	-0.58	6.83	1877	0.47	1879
South Orange....	Essex.....	3.68	21	2.95	-0.73	7.19	1877	0.27	1879
New York.									
Cooperstown.....	Otsego.....	3.36	37	3.01	-0.35	6.65	1857	0.88	1856
Palermo.....	Oswego.....	3.47	37	3.51	+0.04	7.90	1862	0.30	1882
North Carolina.									
Lenoir.....	Caldwell....	3.45	20	0.80	-2.65	9.50	1885	0.70	1889
Ohio.									
N. Lewisburgh..	Champaign..	2.34	19	2.15	-0.19	5.45	1881	0.45	1887
Wauseon.....	Fulton.....	2.68	19	1.85	-0.83	8.92	1881	0.93	74, '89
Oregon.									
Albany.....	Linn.....	3.47	11	5.41	+1.94	7.15	1882	0.97	1887
Eola.....	Polk.....	3.02	21	5.19	+2.17	8.01	1876	0.30	1874
Pennsylvania.									
Dyberry.....	Wayne.....	3.48	20	3.41	-0.07	7.39	1890	1.23	1882
Grampian Hills..	Clearfield...	3.06	21	3.17	+0.11	6.36	1890	0.81	1887
Wellaborough...	Flora.....	3.66	12	2.44	-1.22	7.50	1885	0.44	1879
South Carolina.									
Statesburgh.....	Sumter.....	3.08	10	1.47	-1.61	8.15	1887	0.02	1884
Tennessee.									
Austin.....	Wilson.....	2.90	22	0.61	-2.29	5.11	1883	0.38	1886
Texas.									
New Ulm.....	Austin.....	3.79	19	0.45	-3.34	12.44	1881	0.45	1891
Vermont.									
Stratford.....	Orange.....	3.35	18	2.00	-1.35	6.80	1873	1.30	1882
Virginia.									
Birdenest.....	Northampton	3.57	22	11.55	+7.98	11.55	1891	T.	1884
Washington.									
Fort Townsend..	Jefferson....	2.00	15	1.12	-0.88	3.58	1875	1.00	1885
Wisconsin.									
Madison.....	Dane.....	2.84	22	1.49	-1.35	9.12	1881	T.	1889

*Generally.

YEARS OF GREATEST PRECIPITATION FOR OCTOBER.

The greatest precipitation ever reported for October occurred at Birdsnest, Va., Concordia, Kans., Fort Custer and Helena, Mont., in 1891; along the middle and south Pacific coasts in 1889; from the interior of North Carolina and east Tennessee over Virginia and Maryland in 1885; in the middle and lower Ohio, middle Mississippi, and lower Missouri valleys in 1883; in the Red River of the North and middle Missouri valleys in 1882; from the upper Mississippi valley over a part of the Lake region in 1881; and in south New England, southeast New York, and New Jersey in 1877.

YEARS OF LEAST PRECIPITATION FOR OCTOBER.

The least precipitation ever reported for October occurred at Pensacola, Fla., Montgomery, Ala., Atlanta and Forsyth, Ga., Chattanooga and Knoxville, Tenn., Louisville, Ky., Vevay, Ind., Chicago, Ill., Alpena and Kalamazoo, Mich., New Ulm, Palestine, and Abilene, Tex., Fort Smith, Ark., Fort Stanton, N. Mex., Montrose, Colo., Spokane Falls, Wash., and Los Angeles, Cal., in 1891; from western Wisconsin over Minnesota, North Dakota, and Montana in 1889; in North Carolina and South Carolina in 1886; over the greater part of New York in 1882; on the southeast slope of the Rocky Mountains in 1879; in east Virginia, Maryland, and south Pennsylvania, and in the lower Mississippi valley in 1874.

In 1889, when the precipitation was the greatest reported for October along the middle and south Pacific coasts, it was the least noted for the month over the north-central part of the country; and in 1882, when it was the greatest in the Red River of the North Valley, it was the least in New York.

EXCESSIVE PRECIPITATION.

The following tables show, by states, the number of stations reporting monthly precipitation to equal or exceed 10.00; precipitation to equal or exceed 2.50 in 24 hours; and precipitation to equal or exceed 1.00 in 1 hour in October, 1891:

Monthly precipitation to equal or exceed 10.00.

State.	Number of stations.	State.	Number of stations.
California	1	Virginia	1
Massachusetts	1	Washington	1

Precipitation to equal or exceed 2.50 in 24 hours.

State.	Number of stations.	Dates.	State.	Number of stations.	Dates.
Nebraska	6	2-3, 3, 3-4	Montana	1	1-2
Florida	5	1, 7, 9, 9-10, 12-13	New Jersey	1	19-20
Iowa	5	1-2, 2-3, 3	New Mexico	1	1
Kansas	4	2-3, 3, 3-4	New York	1	13
Virginia	4	6-7, 7-8, 11-12	North Dakota	1	1
Connecticut	3	7-8	South Carolina	1	1-2
Massachusetts	3	7-8, 13-14	Texas	1	Sept. 30-Oct. 1
North Carolina	3	7-8, 8-9	Wisconsin	1	2
Louisiana	1	2	Wyoming	1	Sept. 30-Oct. 1

Precipitation to equal or exceed 1.00 in 1 hour.

State.	Number of stations.	Dates.	State.	Number of stations.	Dates.
Florida	3	1, 9, 12	Texas	1	3
Illinois	1	18			

Table of excessive precipitation, October, 1891.

State and station.	Monthly rainfall to inches, or more.	Rainfall 2.50 inches, or more, in 24 hours.		Rainfall of 1 inch, or more, in one hour.		
		Amt.	Day.	Amt.	Time.	Day.
<i>California.</i>	<i>Inches.</i>	<i>Inches.</i>		<i>Inches.</i>	<i>A. M.</i>	
Cape Mendocino Light-House	10.00?					
Fort Trumbull		2.89	7-8			
New London		2.88	7-8			
Voluntown		3.00	7-8			
<i>Florida.</i>						
Amelia		5.67	1			
Fort Meade		5.75	9	5.75	2 00	9
Homeland		3.45	9-10			
Hypoluxo		3.75	7			
Jupiter				1.64	1 00	12
Manatee				1.51	1 15	1
Orange City		3.31	12-13			
<i>Illinois.</i>						
Pana				1.25	1 00	18
<i>Iowa.</i>						
Alta (2)		2.57	1-2			
Carroll		4.10	2-3			
Logan		3.15	3			
Panama		4.22	2-3			
Sac City		3.50	2-3			
<i>Kansas.</i>						
Concordia		2.90	2-3			
Downs		3.95	3-4			
Englewood		2.81	3			
Larned		2.50	2-3			
<i>Louisiana.</i>						
Jackson Barracks		2.52	2			
<i>Massachusetts.</i>						
Cotuit	10.14	3.89	13-14			
New Bedford (1)		2.70	7-8			
Vineyard Haven		2.66	13-14			
<i>Montana.</i>						
Fort Custer		4.60	1, 2			
<i>Nebraska.</i>						
Ashland		2.90	3			
De Soto		2.75	2-3			
Fort Omaha		3.50	2-3			
Fremont		2.64	2-3			
Harvard		3.19	2-3			
Weeping Water		3.25	3-4			
<i>New Jersey.</i>						
Locktown		2.85	19-20			
<i>New Mexico.</i>						
Springer		2.55	1			
<i>New York.</i>						
Setauket		2.85	13			
<i>North Carolina.</i>						
Currituck Inlet		3.05	8-9			
Hatteras		4.48	7-8			
Weldon		3.46	7-8			
<i>North Dakota.</i>						
Valley City		3.80	1			
<i>South Carolina.</i>						
Charleston		2.98	1-2			
<i>Texas.</i>						
Brownsville				1.24	0 44	3
Childress		2.57	*			
<i>Virginia.</i>						
Birdsnest	11.55	6.85	7-8			
Do		2.50	11-12			
Cape Charles		4.00	6-7			
Fort Monroe		3.06	7-8			
Norfolk		2.95	7-8			
<i>Washington.</i>						
Neah Bay	10.06					
<i>Wisconsin.</i>						
Rhineland		2.67	2			
<i>Wyoming.</i>						
Fort Washakie		3.50	*			

* Sept. 30-Oct. 1.

MAXIMUM RAINFALL IN ONE HOUR OR LESS.

The following table is a record of the heaviest rainfall during October, 1891, for periods of five and ten minutes and one hour, as reported by regular stations of the Weather Bureau furnished with self-registering gauges:

Station.	Maximum fall in—					
	5 min.	Date.	10 min.	Date.	1 hour.	Date.
	<i>Inch.</i>		<i>Inch.</i>		<i>Inch.</i>	
Atlanta, Ga.	0.04	11	0.08	11	0.23	11
Bismarck, N. Dak.	0.10	8	0.16	8	0.38	8
Boston, Mass.	0.05	14	0.10	14	0.15	14
Buffalo, N. Y.	0.05	18	0.10	18	0.25	18
Cincinnati, Ohio	0.07	15	0.10	15	0.27	4
Chicago, Ill.	0.01	2	0.03	3	0.09	2
Cleveland, Ohio	0.02	19	0.04	19	0.13	19
Denver, Colo.	0.12	3	0.14	3	0.55	3
Detroit, Mich.						
Dodge City, Kans.						

Maximum rainfall in one hour or less—Continued.

Station.	Maximum fall in—					
	5 min.	Date.	10 min.	Date.	1 hour.	Date.
Duluth, Minn.	Inch.		Inch.		Inch.	
Eastport, Me.	0.03	17	0.05	17	0.20	17
Galveston, Tex.	0.06	8, 14	0.12	14	0.38	8
Indianapolis, Ind.	0.10	4	0.15	4	0.50	4
Jacksonville, Fla.	0.08	4	0.10	4	0.30	4
Jupiter, Fla.	0.15	7	0.30	7	0.59	7
Kansas City, Mo.	0.06	3	0.08	3	0.20	3
Key West, Fla.	0.35	9	0.60	2	0.95	2
Marquette, Mich.	0.06	3	0.09	3	0.30	3
Memphis, Tenn.	0.20	4	0.30	4	0.95	4
New York, N. Y.	0.09	20	0.10	20	0.12	20
New Orleans, La.	0.10	2	0.17	2	0.75	2-3
Norfolk, Va.						
Philadelphia, Pa.	0.09	20	0.16	20	0.44	20
Philadelphia Water Works	0.09	20	0.18	20	0.37	20
Pittsburg, Pa.	0.05	6	0.06	6	0.33	6
Portland, Oregon	0.05	28	0.07	28	0.25	15
Saint Louis, Mo.	0.02	17	0.04	17	0.10	17
Saint Paul, Minn.						
San Diego, Cal.						
San Francisco, Cal.						
Savannah, Ga.	0.20	2	0.30	2	0.35	2
Washington, D. C.	0.28	19	0.45	19	0.80	19
Wilmington, N. C.	0.20	1	0.32	1	0.97	1

* Less than 0.05 in 1 hour. † Record incomplete.

The following tables show the number of years for which monthly precipitation to equal or exceed 10.00 inches, daily precipitation to equal or exceed 2.50 inches, and hourly precipitation to equal or exceed 1.00 inch has been reported in the several states and territories for October during the last 22 years:

Excessive monthly precipitation.

State.	No. years noted.	State.	No. years noted.
Florida	12	Kentucky	1
Texas	10	Maine	1
North Carolina	7	Mississippi	1
Georgia	5	New Jersey	1
New Hampshire	5	Ohio	1
Oregon	5	Rhode Island	1
Washington	5	Tennessee	1
Louisiana	4	Arizona	0
New York	4	Colorado	0
California	4	The Dakotas	0
Michigan	3	Delaware	0
Maryland	3	Idaho	0
Missouri	3	Indian Territory	0
South Carolina	2	Minnesota	0
Massachusetts	2	Montana	0
Virginia	2	Nebraska	0
Alabama	1	Nevada	0
Arkansas	1	Pennsylvania	0
Connecticut	1	Utah	0
District of Columbia	1	Vermont	0
Illinois	1	West Virginia	0
Indiana	1	Wisconsin	0
Iowa	1	Wyoming	0
Kansas	1	New Mexico	0

Excessive daily precipitation (24 hours).

State.	No. years noted.	State.	No. years noted.
Florida	17	Michigan	5
North Carolina	15	Ohio	5
Texas	15	Arkansas	4
Louisiana	13	Oregon	4
Georgia	12	Tennessee	4
Kansas	11	The Dakotas	4
Illinois	10	Wisconsin	4
Pennsylvania	10	Kentucky	3
New York	10	Minnesota	3
South Carolina	9	New Hampshire	3
Alabama	8	Washington	3
Maryland	8	Indiana	2
Missouri	8	New Mexico	2
Rhode Island	8	California	1
Massachusetts	8	Utah	1
Virginia	8	Vermont	1
Maine	7	West Virginia	1
Connecticut	7	Delaware	1
Nebraska	7	Montana	1
New Jersey	7	Wyoming	1
Mississippi	6	Arizona	0
Iowa	6	Colorado	0
District of Columbia	5	Idaho	0
Indian Territory	5	Nevada	0

Excessive hourly precipitation.

State.	No. years noted.	State.	No. years noted.
Texas	10	Arizona	0
Iowa	5	California	0
Florida	5	Colorado	0
Kansas	4	Delaware	0
North Carolina	4	Idaho	0
Illinois	4	The Dakotas	0
District of Columbia	3	Kentucky	0
Louisiana	3	Maine	0
Nebraska	3	Michigan	0
Alabama	3	Minnesota	0
Georgia	2	Montana	0
Indiana	2	Nevada	0
Arkansas	2	New Hampshire	0
Connecticut	1	New Mexico	0
Indian Territory	1	Oregon	0
Maryland	1	Rhode Island	0
Mississippi	1	Tennessee	0
Missouri	1	Utah	0
New Jersey	1	Virginia	0
Ohio	1	Vermont	0
Pennsylvania	1	Washington	0
South Carolina	1	West Virginia	0
Wisconsin	1	Wyoming	0

The following tables give exceptionally heavy monthly, daily, and hourly precipitation reported for October during the last 22 years:

Monthly.

Station and state.	Am't.	Year.	Station and state.	Am't.	Year.
Reidsville, N. C.	Inches.	Year.	Mayport, Fla.	Inches.	Year.
Sims, Cal.	29.09	1885		20.03	1880
	28.57	1889			

Daily (24 hours).

Station and state.	Amount.	Date.	Station and state.	Amount.	Date.
	Inches.			Inches.	
Fernandina, Fla.	13.14	20-21, 1882	Birdsnest, Va.	6.85	7-8, 1891
Brackettville, Tex.	13.06	1-2, 1881	Fort Meade, Fla.	5.75	9, 1891
Saint Augustine, Fla.	10.31	9-10, 1880	Amelia, Fla.	5.67	1, 1891
Key West, Fla.	9.24	20-21, 1883	Jacksonville, Fla.	5.15	1, 1890
Newport, Fla.	8.20	8, 1876	New Bedford, Mass.	5.15	23-24, 1890
Galveston, Tex.	7.77	2, 1871	Abbeville, La.	5.08	21, 1890
Fort Robinson, Nebr.	7.07	23, 1887	Trial, S. C.	5.02	22-23, 1890

One hour and less.

Station and state.	Amount.	Time.	Date.
	Inches.	h. m.	
Savannah, Ga.	0.35	0 05	23, 1890
Key West, Fla.	0.35	0 05	9, 1891
Cleveland, Ohio	0.30	0 05	13, 1890
Galveston, Tex.	0.30	0 05	30, 1890
Jupiter, Fla.	0.30	0 05	1, 1890
Key West, Fla.	0.30	0 05	10, 1890
New Orleans, La.	0.30	0 05	15, 1890
Washington, D. C.	0.28	0 05	19, 1891
Brownsville, Tex.	1.20	0 06	23, 1884
Fort Scott, Kans.	1.80	0 20	2, 1881
Cresco, Iowa	1.11	0 20	10, 1878
Galveston, Tex.	2.12	0 25	30, 1877
Abilene, Tex.	1.50	0 25	24, 1885
Des Moines, Iowa	2.30	0 30	15, 1880

SNOW (in inches and tenths).

The first snow of the season was reported as follows: 1st, at points in North and South Dakota, Wyoming, and Colorado, and at Salt Lake City, Utah. On this date snow fell in Montana and the British Northwest Territory. 2d, at stations in North Dakota and Montana, and at Denver and Smoky Hill Mine, Colo. Heavy snow fell in the morning at Salt Lake City, Utah. 3d, Fort Keogh, Mont. 4th, Rapid City, S. Dak., and at points in Wisconsin. 5th, Bismarck, N. Dak., Pierre, S. Dak., in Nebraska and north New Mexico. 6th, Keokuk and Sioux City and generally throughout Iowa, north and west Missouri, and east Nebraska. 7th, Lake Saint Clair, Mich.;

this is reported the earliest date on record for snow near Detroit, Mich., except that noted for 1872, when the first snow fell on September 7th. 11th, snow fell generally in north New England and northeast New York. 12th, Pueblo, Colo., and near Cumberland, Md. 13th, New Haven, Conn., Barren Creek Springs, Md., and Brunswick, Mo. 14th, Saint Vincent, Minn., Rockland, Mich., and at points in Wisconsin. 18th, Sault de Ste. Marie, Mich., and Harrodsburgh, Ky. 19th, Marquette, Mich. 20th, Linville, N. C., in the Shenandoah Valley, Virginia, in northeast West Virginia, and central Pennsylvania. 21st, western North Carolina. 22d, snow fell generally in northern New York, and at points in Massachusetts, Connecticut, Rhode Island, and in the mountains of Virginia and West Virginia. 23d, eastern New York, eastern Massachusetts, Eastport, Me., New London, Conn., and in the mountains of Pennsylvania. 24th, Northfield, Vt. 25th, Forts Mackinac and Brady, Mich. 27th, Cleveland, Ohio, Williamstown, Mass., Kennebec Arsenal, Me., and at points in Vermont. 30th, Moorhead, Minn., and at points in the Dakotas and Wisconsin. 31st, Duluth, Minn., and at points in North Dakota and Minnesota.

Chart V shows the depth of snowfall reported for the month.

The heaviest monthly snowfall was reported in northwest North Dakota, along the northeast slope of the Rocky Mountains in Montana and Wyoming, in the mountains of central Colorado, and in central Nevada, where it exceeded 5. At Helena, Mont., the total depth was 15.5, of which about 14 fell the night of the 11-12th. 14 fell at Fort Buford, N. Dak., about 13 at Fort Yellowstone, Wyo., and 6 to 8 at mountain stations in Colorado.

Snowfall of 1 inch or more was reported as follows, and in states and territories where the maximum depth was below that amount the station reporting the greatest is given: *California*.—Summit, 0.5. *Colorado*.—Box Elder and Castle Rock, 8; Gold Hill, 7.5; Smoky Hill Mine, 7; Twin Lakes, 6.8; Climax, 6.5; Breckenridge and Watervale, 6; Husted and Stamford, 5; Dumont, 4.6; Table Rock and Thon, 4; Cumbres, 2.5; Como (near), 2; Jefferson, 1.7; Georgetown, 1.5; Loveland, 1.2; Platoro, 1.1. *Connecticut*.—Mansfield, 4; Colchester and Voluntown, 3; New London, 2.5. *Iowa*.—Richard, 4. *Kansas*.—Kansas City, Morse, Norton, and Seneca, trace. *Kentucky*.—Harrodsburgh, 0.1. *Maine*.—Bar Harbor, Belfast, Calais, Farmington, Kennebec Arsenal, Lewiston, and Mayfield, trace. *Maryland*.—Barren Creek Springs, trace. *Massachusetts*.—Blue Hill Observatory and Dudley, 3; Westborough, 2.5; Ashland, Chestnut Hill, Concord, Fall River, Mansfield, and Monson, 2; Milton, 1.5; Gilbertville, Leominster, Taunton (4), and Wakefield, 1. *Michigan*.—Marquette, 2.3; Lathrop, 1. *Minnesota*.—Crookston, 2; Saint Vincent and Leech Lake, 1. *Missouri*.—Brunswick, 2. *Montana*.—Helena,

15.5; Fort Custer, 8; Glendive, 7; Camp Poplar River, 3.8; Fort Assiniboine, 3.5. *Nebraska*.—Fort Robinson, 1.5; Springfield and Whitman, 1. *Nevada*.—Austin, 5; Eureka and Stofiel, 1. *New Hampshire*.—Berlin Mills, 1. *New Jersey*.—Dover and Oceanic, trace. *New Mexico*.—Gallinas Spring, 2.5; Folsom, 1.5. *New York*.—Malone, 5.3; Fleming, 2. *North Carolina*.—Linville, trace. *North Dakota*.—Fort Buford, 14; Willow City, 5; Woodbridge, 2.4; Grafton, 1. *Ohio*.—Ashland, Bangorville, Cleveland, Demos, Garrettsville, Gratiot, Marion, New Alexandria, Orangeville, and Youngstown, trace. *Oregon*.—Beulah, 1.3; Joseph, 1. *Pennsylvania*.—Uniontown, 0.1. *Rhode Island*.—Pawtucket, 3; Providence (1), 2; Bristol, Kingston (1 and 2), Providence (2 and 3), 1. *South Dakota*.—Oelrichs, 4; Cross, 2. *Utah*.—Provo City, 4.37; Salt Lake City, 3.3; Promontory, 1. *Vermont*.—Burlington, 0.4. *Virginia*.—Marion and Wytheville, trace. *West Virginia*.—Kingwood, trace. *Wisconsin*.—Bayfield, 2. *Wyoming*.—Fort Washakie, 357; Fort Yellowstone, 12.9; Fort McKinney, 6.1; Sheridan, 4.8; Camp Pilot Butte, 2.5; Lander, 1.5; Fort Fetterman, 1.

DEPTH OF SNOW ON GROUND AT THE CLOSE OF THE MONTH.

A depth of 1 to 2 was reported at points in central Minnesota and extreme northern Wisconsin, and trace to 0.5 at stations in North Dakota and northern Montana.

HAIL.

Description of the more severe hailstorms of the month is given under "Local storms." Hail was reported as follows: 1st, Colorado and Nevada. 4th, Nebraska and South Dakota. 5th, Wisconsin. 6th, Iowa and Nebraska. 7th, Illinois. 8th, Illinois, Indiana, and Massachusetts. 11th, Colorado and Maryland. 12th, Maryland and West Virginia. 13th, Michigan. 14th, Indiana, Michigan, Ohio, and Wisconsin. 15th, Michigan, New York, Ohio, Vermont, and Wisconsin. 16th, Iowa, Minnesota, Missouri, New York, Wisconsin, and Wyoming. 17th, Illinois and Wisconsin. 18th, Illinois, Indiana, Kentucky, Ohio, and Wisconsin. 19th, North Carolina. 20th, Massachusetts. 21st, Ohio. 22d, North Carolina, Ohio, Pennsylvania, Virginia, and West Virginia. 25th, Pennsylvania. 26th, Maine, Maryland, Massachusetts, New York, Ohio, and Pennsylvania. 27th, Massachusetts, New York, Ohio, Pennsylvania, and West Virginia. 28th, Oregon. 29th, Pennsylvania and Washington. 31st, Michigan.

SLEET.

Sleet was reported as follows: 1st, Utah. 4th and 5th, South Dakota. 6th, Iowa, Kansas, and Missouri. 13th, South Dakota. 19th, South Carolina. 22d, New York, Ohio, Virginia, and West Virginia. 26th, Ohio and Pennsylvania. 27th, New York. 29th, Wyoming. 31st, North Dakota.

WINDS.

The prevailing winds in October, 1891, are shown on Chart II by arrows flying with the wind. In the Atlantic coast and east Gulf states, Florida, the Ohio Valley and Tennessee, and over the middle-eastern slope of the Rocky Mountains northwest to northeast winds were most frequently noted; over the west Gulf states they were generally from east to south; in the extreme northwest, from west to northwest; on the northeast slope of the Rocky Mountains and over the northern plateau region, from southwest to northwest; on the middle-eastern slope of the Rocky Mountains, from south to west; over the southern plateau, from northeast to southeast; on the north Pacific coast, from southeast to southwest; on the south Pacific coast, from west to northwest; in the Lake region, over the southeast slope of the Rocky Mountains, and on the middle Pacific coast, variable.

HIGH WINDS.

[In miles per hour.]

Wind velocities of 50 miles, or more, per hour were reported at regular stations of the Weather Bureau as follows: 11th, 66, se., at Huron, S. Dak., 60, ne., at Block Island, R. I.; 60, ne., at Kitty Hawk, N. C.; 52, se., at Moorhead, Minn. 12th, 78, ne., at Kitty Hawk, N. C.; 72, n., at Hatteras, N. C.; 68, ne., at Block Island, R. I. 13th, 72, ne., at Block Island, R. I.; 62, ne., at Kitty Hawk, N. C.; 58, ne., at Nantucket, Mass.; 55, ne., at Woods Holl, Mass.; 50, n., at Hatteras, N. C. 14th, 61, s., at Fort Canby, Wash.; 61, ne., at Woods Holl, Mass.; 60, ne., at Block Island, R. I. 15th, 60, se., at Fort Canby, Wash. 20th, 58, e., at Block Island, R. I. 22d, 64, n., at Block Island, R. I.; 58, s., at Fort Canby, Wash.; 58, s., at Winnemucca, Nev.; 58, nw., at Hatteras, N. C. 22d, 64, n., at Block Island, R. I.; 60, s., at Fort Canby, Wash.; 60, nw., at Woods Holl, Mass.; 56, ne., at Nantucket, Mass. 28th, 50, n., at Hatteras,

N. C. 29th, 56, w., at Fort McKinney, Wyo. 30th, 54, nw., at Bismarck, N. Dak. 31st, 61, nw., at Detroit, Mich.; 54, w., at Red Wing, Minn.; 52, nw., at Huron, S. Dak.

LOCAL STORMS.

7-8th.—At Birdsnest, Va., 6.85 inches of rain fell from 9 p. m., 7th, to 1 a. m., 8th. With one exception, this was the heaviest rainfall noted at that place in 23 years. At Boston, Mass., there was a decrease of pressure of .49 inch from 8 p. m., 7th, to 8 a. m., 8th, and heavy northeast changing to northwest winds prevailed along the Massachusetts coast.

10-11th.—At Cape Henry, Va., high northeast winds prevailed. The anemometer spindle was broken by the force of the wind, and the cups were carried away. Winds of hurricane force were reported off the coast.

11-12th.—At Helena, Mont., a heavy snowstorm, with high southwest winds, continued during the night, causing damage to electric wires and trees.

11-13th.—At Vineyard Haven, Mass., a northeast storm began at 3 p. m., 11th, and continued during the 12th and 13th. Exceptionally severe gales continued off the middle Atlantic coast.

11-14th.—Unusually heavy gales along the coast from the Carolinas to Nova Scotia caused a number of marine disasters. At Hatteras, N. C., the wind reached a velocity of 72 miles per hour from the north on the 12th; the tide was very high, and all traffic was suspended. At Kitty Hawk, N. C., the wind attained a velocity of 78 miles per hour from the northeast on the 12th. High northerly winds during the 12th and 13th caused damage to seaside property along the New Jersey coast. At New Haven, Conn., high northeast winds, with heavy rain, and snow, at intervals, interfered with traffic during the 13th, and all vessels were compelled to seek shelter. At Block Island, R. I., a northeast gale continued from the 11th to 14th, the wind reaching a velocity of 72 miles per hour on the 13th. The storm was generally severe along the New England coast during this period, and a number of minor disasters to shipping were reported.

18th.—A report from Port Angeles, Wash., stated that

high west to northwest winds prevailed in the Straits, and that many trees were blown down and telegraph wires considerably damaged along the coast. At Seymour, Ind., a heavy thunderstorm of brief duration occurred in the evening, attended by wind reaching a velocity of 40 miles per hour, and a heavy fall of unusually large hailstones.

20th.—At New Haven, Conn., strong south winds in the afternoon caused high water, and wharves were flooded. The highest tide in a number of years was reported at New London, Conn. At Block Island, R. I., the wind reached a velocity of 58 miles per hour from the northeast.

22d.—During a north gale at Block Island, R. I., the wind reached a velocity of 64 miles per hour. High winds also prevailed over New York, along the New Jersey coast, and over Chesapeake Bay.

22d-25th.—High winds prevailed over Long Island Sound and along the New England coast, resulting in a number of disasters to shipping.

26th.—During a thunderstorm in the afternoon a barn near Ithaca, N. Y., was struck by lightning and burned. Heavy gales were reported over the lower lakes and the east part of the upper lake region. The Canadian propeller "Sovereign" was lost in a gale on Lake Superior. Steamers running between Cleveland, Ohio, and Detroit, Mich., were delayed by the storm. The storm was very severe in northern Ohio in the evening, and at Conneaut, Ohio, a number of buildings were blown down.

29th.—During high northeast winds on the east coast of southern Florida two schooners went ashore, one on Content Reef, 35 miles northeast of Key West, and the other near Lake North Inlet; loss estimated at \$5,000 to \$6,000.

30th.—High winds shifting to northwest, with rain changing to snow, prevailed over North Dakota, the north part of South Dakota, and northern Minnesota.

31st.—High west wind caused damage about Red Wing, Minn. Heavy gales prevailed over the Great Lakes. At Detroit, Mich., a wind velocity of 61 miles per hour, and an extreme velocity of 120 miles, was recorded at 4.11 p. m.

INLAND NAVIGATION.

LOW WATER.

On the 5th the stage of water in the Tennessee River at Chattanooga, Tenn., was 1.8 foot, and navigation was reported suspended. No decided rise occurred in the river at that point during the month, and on the 29th, 30th, and 31st it stood at 1.4 foot on the gauge, the lowest stage noted in 4 years. Except to points above Chattanooga navigation had been closed on the Tennessee River after September 18, 1891. The Ohio River continued low throughout the month, and reports of the 5th stated that a number of steamboats were grounded between Cincinnati, Ohio, and Point Pleasant, W. Va. A press report from Augusta, Me., stated that on the 5th the Kennebec River was lower than at any time during the last 38 years. On the 27th the stage of water in the Chattahoochee River was so low that all boats were taken off, except one light-draught boat plying between Columbus, Ga., and River Junction, Fla. On the 31st the stage of the Red River at Shreveport, La., was —0.5 foot, too low for navigation, and one light-draught boat, only, was running. The Mississippi River continued low, rendering navigation above Memphis, Tenn., difficult. At Saint Louis, Mo., the stage of the water varied from 4.0 feet on the 5th to 9th, to 6.4 feet on the 18th; at Cairo, Ill., from 2.0 feet from the 10th to 13th, to 3.7 feet on the 1st and 21st; and at Memphis, Tenn., from 1.3 foot on the 14th and 15th, to 3.4 feet on the 1st.

STAGE OF WATER IN RIVERS.

In the following table are shown the danger-points at the various river stations; the highest and lowest stages for the month, with the dates of occurrence, and the monthly ranges:

Heights of rivers above low-water mark, October, 1891 (in feet and tenths).

Stations.	Danger-point on gauge.	Highest water.		Lowest water.		Monthly range.
		Date.	Height.	Date.	Height.	
<i>Red River.</i>						
Shreveport, La.	29.9	1	2.7	31	—0.6	3.3
<i>Arkansas River.</i>						
Fort Smith, Ark.	22.0	3	5.2	27	0.7	4.5
Little Rock, Ark.	23.0	7	4.9	25	2.9	2.0
<i>Missouri River.</i>						
Fort Buford, N. Dak.		21, 22	6.4	7-17	5.2	1.2
Sioux City, Iowa.	18.7	3, 30, 31	4.4	20	3.8	0.6
Kansas City, Mo.	21.0	10, 11	8.8	1	6.1	2.7
<i>Mississippi River.</i>						
Saint Paul, Minn.	14.0	3, 4	1.8	24	1.2	0.6
La Crosse, Wis.	11.8	12	1.6	1	0.2	1.4
Dubuque, Iowa.	16.0	17	2.6	1, 2, 3	1.0	1.6
Davenport, Iowa.	15.0	18, 19	1.3	1, 2	0.0	1.3
Keokuk, Iowa.	14.0	21, 22, 23	0.9	1, 2, 3	—0.5	1.4
Saint Louis, Mo.	30.0	18	6.4	5-9	4.0	2.4
Cairo, Ill.	40.0	1, 21	3.7	10-13	2.0	1.7
Memphis, Tenn.	33.0	1	3.4	14, 15	1.3	2.1
Vicksburg, Miss.	41.0	1	3.4	19, 20	—1.2	4.6
New Orleans, La.	13.0	6, 7, 8	4.0	18	2.4	1.6
<i>Ohio River.</i>						
Parkersburg, W. Va.	28.0	14	4.0	6-9	1.8	2.2
Cincinnati, Ohio.	45.0	19	6.2	10-16	4.5	1.7
Louisville, Ky.	24.0	23	3.6	13-17, 28-30	3.0	0.6
<i>Cumberland River.</i>						
Nashville, Tenn.	40.0	1	0.6	16-20	0.0	0.6
<i>Tennessee River.</i>						
Chattanooga, Tenn.	33.0	2, 3	1.9	29, 30, 31	1.4	0.5
<i>Monongahela River.</i>						
Pittsburg, Pa.	29.0	10	6.9	28	5.0	1.9
<i>Savannah River.</i>						
Augusta, Ga.	32.0	1	6.8	24, 25, 28, 29	5.5	1.3
<i>Willamette River.</i>						
Portland, Oregon.	15.0	31	3.7	13, 14	—0.7	3.4
<i>Susquehanna River.</i>						
Harrisburg, Pa.	17.0	24	4.8	4-7	1.7	3.1
<i>Alabama River.</i>						
Montgomery, Ala.	48.0	1, 3	0.6	31	—0.3	0.9

ATMOSPHERIC ELECTRICITY.

THUNDERSTORMS.

Description of the more severe thunderstorms reported for the month is given under "Local storms."

Thunderstorms were reported as follows: East of the Rocky Mountains they were reported in the greatest number of states, 12, on the 26th; in 5 to 10 on the 1st to 3d, 6th, and 16th to 18th; and in 1 to 4 on the 4th, 5th, 7th to 9th, 11th to 15th, 19th, 20th, 22d, 23d, 25th, 27th, and 29th to 31st. No thunderstorms were reported on the 10th, 21st, 24th, and 28th.

East of the Rocky Mountains thunderstorms were reported on the greatest number of dates, 12, in Michigan; on 5 to 10 in Florida, Illinois, Iowa, Kansas, New Jersey, New York, Texas, and Wisconsin; and on 1 to 4 in Arkansas, Connecticut, Delaware, District of Columbia, Indiana, Indian Territory, Kentucky, Louisiana, Maryland, Massachusetts, Minnesota, Mississippi, Missouri, Nebraska, New Hampshire, North Carolina, North Dakota, Ohio, Pennsylvania, South Dakota, Vermont, Virginia, and West Virginia.

West of the Rocky Mountains thunderstorms were reported in California on the 8th and 9th; in Colorado on the 11th; in Nevada on the 4th, 5th, 9th, and 22d; in New Mexico on the 1st and 12th; in Oregon on the 28th; in Utah on the 1st; and in Washington on the 27th to 29th. No thunderstorms were reported in Alabama, Georgia, Idaho, Maine, Montana, Okla-

homa Territory, Rhode Island, South Carolina, Tennessee, and Wyoming.

AURORAS.

Auroras were reported as follows: 1st, Eastport, Me.; Salem Corners, Pa. 2d, Salem Corners, Pa.; Webster, S. Dak. 5th, Orono, Me. 8th, Alta and Fontanelle, Iowa; Eastport, East Machias, and Portland, Me.; Saint Vincent, Minn.; Spearfish, S. Dak.; Appleton, Peshtigo, and Westfield, Wis. 9th, Riley, Ill.; Alta, Iowa; Mayfield, Me.; Groveton, N. H.; Bismarck, N. Dak.; Salem Corners, Pa.; Frankfort and Webster, S. Dak.; Madison and Westfield, Wis. 10th, Riley, Ill.; Mayfield and Orono, Me.; Madison, Wis. 13th to 16th, Hartington, Nebr. 20th, Alta, Iowa; Mayfield, Me.; Harvey, Wis. 23d, Alta, Iowa; Newburyport, Mass.; Rockland, Mich.; Glendive, Mont.; Grand Rapids and Wild Rice, N. Dak.; Salem Corners, Pa.; Gary and Webster, S. Dak.; Harvey and Peshtigo, Wis.; 24th, East Machias and Mayfield, Me.; Williamstown, Mass.; Fort Assiniboine and Glendive, Mont.; Groveton, N. H.; Le Roy, Pa. 25th, Eastport and Mayfield, Me.; Saint Vincent, Minn.; Fort Assiniboine, Mont.; Wolsey, S. Dak.; Appleton, Delavan, Madison, and Medford, Wis. 27th, Thornville, Mich.; Webster, S. Dak. 28th, Mayfield, Me.; Concord, Mass.; Turin, N. Y.; Grand Rapids, N. Dak.; Webster, S. Dak. 29th, Grand Rapids, N. Dak.; Webster, S. Dak. 31st, Alta, Iowa.

MISCELLANEOUS PHENOMENA.

DROUGHT.

In parts of New England, central Virginia, the south Atlantic and Gulf states, Indian and Oklahoma territories, the north part of the Ohio Valley, Tennessee, Arkansas, Missouri, and Kansas drought prevailed throughout the month. In New Hampshire, Vermont, Massachusetts, and during the early part of the month in Connecticut, streams were low and water was scarce for manufacturing purposes. In the other sections named dry weather interfered with farming operations, streams were very low, wells were failing, and in Texas and Kansas water was scarce on the stock ranges.

PRAIRIE AND FOREST FIRES.

Extensive and destructive prairie fires were reported in Oklahoma Territory, and from the 27th to the 31st near Fort Assiniboine, Mont., in Custer, Cherry, Lincoln, and Logan counties, and the Wood River Valley, Nebr., in Gray, Ford, and Butler counties, Kans., and near Bismarck, N. Dak.

Forest fires were reported in northern Alabama, in Bienville parish, La., in eastern Arkansas, and Johnson county, Ark., near Chattanooga, Tenn., and in the south and west parts of Williamson county, Tenn., near Meadow Valley, Wis., and Red Bluff, Cal., and in the Cascade Mountains near Hot Springs, Wash.

VERIFICATIONS.

[Verifications made by Professor C. F. Marvin, assisted by Mr. H. E. Williams, chief clerk of the Forecast Room.]

WIND SIGNALS FOR SEPTEMBER, 1891.

Statement showing percentages of justifications of wind signals for the month of September, 1891.

Wind signals—(Ordered by Major H. H. C. Dunwoody).—Total number of signals ordered, 50; justified as to velocity, 35; justified as to direction, 43. Of the signals ordered, 49 were cautionary, of which 34 were justified; and 1 storm signal was ordered, which was justified; 22 signals were ordered for easterly winds, of which 19 were justified, and 28 were ordered for westerly winds, of which 24 were justified. Percentage of justifications, 62.6. Number of winds without signals, 18. Number of signals ordered late, 5.

No cold-wave signals were ordered during the month.

FORECASTS FOR 48 HOURS IN ADVANCE.

Appreciating the great importance that long time predic-

tions possess for the general public the Chief of the Weather Bureau has authorized forecasts for 48 and 72 hours, covering the 2d and 3d days in advance. These are optional with the forecast official, and are only made when clearly in the public interest, and cover, in all cases, considerable areas of country, and are not confined to localities.

Percentages of verifications of forecasts made for second day in advance. Number of predictions made: weather, 103; temperature, 135. Percentages of verifications: weather, 74.5; temperature, 75.1; weather and temperature combined, 74.8.

FORECASTS FOR 24 HOURS IN ADVANCE.

The forecasts for districts east of the Rocky Mountains for September, 1891, were made by Major H. H. C. Dunwoody, Signal Corps, and those for the Pacific coast districts were made at San Francisco, Cal., by 1st Lieutenant John P. Finley, 15th Infantry.

Percentages of forecasts verified, September, 1891.

State.	Weather.	Temperature.	Weather and temperature combined.	State.	Weather.	Temperature.	Weather and temperature combined.
Maine.....	84.3	85.3	84.7	Arkansas.....	90.3	93.3	91.5
New Hampshire.....	87.3	82.0	85.2	Tennessee.....	95.0	96.0	93.0
Vermont.....	89.7	85.3	87.9	Kentucky.....	96.3	92.3	94.7
Massachusetts.....	88.3	87.0	87.6	Ohio.....	95.3	87.7	92.3
Rhode Island.....	94.3	79.0	88.2	West Virginia.....	92.7	70.3	83.7
Connecticut.....	92.7	83.3	88.9	Indiana.....	95.0	88.3	92.3
Eastern New York.....	92.7	83.3	88.9	Illinois.....	95.0	91.7	93.7
Western New York.....	91.7	94.0	92.6	Lower Michigan.....	91.3	88.0	90.0
Eastern Pennsylvania.....	90.3	84.3	87.9	Upper Michigan.....	85.7	83.3	84.7
Western Pennsylvania.....	88.3	87.0	87.8	Wisconsin.....	92.7	86.3	90.1
New Jersey.....	91.3	80.0	86.8	Minnesota.....	88.0	75.0	82.8
Delaware.....	92.7	79.3	87.3	Iowa.....	97.3	84.0	92.0
Maryland.....	89.0	76.7	84.1	Kansas.....	96.3	87.2	92.7
District of Columbia.....	89.3	71.7	82.3	Nebraska.....	96.0	74.7	87.5
Virginia.....	89.3	80.3	85.7	Missouri.....	96.7	88.7	93.5
North Carolina.....	97.3	83.3	91.7	Colorado.....	85.0	74.3	80.7
South Carolina.....	93.7	86.7	90.9	North Dakota.....	92.3	71.7	84.1
Georgia.....	90.0	85.0	88.0	South Dakota.....	93.3	73.0	85.2
Eastern Florida.....	90.7	90.7	93.1	Northern California.....	88.7	83.7	86.7
Western Florida.....	87.0	97.3	91.1	Southern California.....	93.7	89.3	91.9
Alabama.....	93.7	84.7	90.1	Oregon.....	89.7	67.0	80.6
Mississippi.....	93.3	85.0	90.0	Washington.....	88.0	68.7	80.3
Louisiana.....	90.7	91.0	90.8				
Texas.....	89.0	91.3	89.9	Monthly percentage.....	91.7	84.3	88.7

In determining the monthly percentage of weather and temperature combined, the Pacific coast states are not included. The forecasts of temperature in districts east of the Rocky Mountains for September, 1891, were made with reference to the maximum temperature alone; that is, a prediction of warmer or cooler indicated that the maximum temperature of the day designated would be higher or lower than the maximum of the previous day. The monthly percentage of weather and temperature combined is determined by multiplying the percentage of weather by 6, and the percentage of temperature by 4, and dividing their sum by 10.

FORECASTS FOR 48 AND 72 HOURS IN ADVANCE.

Percentages of verifications of forecasts made for second day in advance in October, 1891. Number of predictions made: weather, 409; temperature, 63. Percentages of verifications: weather, 91.6; temperature, 78.3; weather and temperature combined, 90.3.

Percentages of verifications of forecasts made for third day in advance. Number of predictions made: weather, 29; temperature, 3. Percentages of verifications: weather, 89.0; temperature, 100.0; weather and temperature combined, 89.7.

A statement of the percentage of justification of wind signals for October, 1891, will be published in the REVIEW for November, 1891.

FORECASTS FOR 24 HOURS IN ADVANCE.

The forecasts for districts east of the Rocky Mountains for October, 1891, were made by Professor H. A. Hazen, Weather Bureau, and those for the Pacific coast districts were made at San Francisco, Cal., by 1st Lieutenant John P. Finley, 15th Infantry.

Percentages of forecasts verified, October, 1891.

State.	Weather.	Temperature.	Weather and temperature combined.	State.	Weather.	Temperature.	Weather and temperature combined.
Maine.....	93.9	88.7	91.8	Arkansas.....	97.1	85.8	92.6
New Hampshire.....	91.3	88.4	90.1	Tennessee.....	97.4	87.4	93.4
Vermont.....	85.8	90.6	87.7	Kentucky.....	97.7	90.3	94.7
Massachusetts.....	90.0	89.0	89.6	Ohio.....	93.2	85.2	90.0
Rhode Island.....	88.1	88.4	88.2	West Virginia.....	93.9	81.6	89.0
Connecticut.....	86.5	86.5	86.5	Indiana.....	94.2	82.9	89.7
Eastern New York.....	90.0	84.8	87.9	Illinois.....	92.6	84.2	89.2
Western New York.....	80.0	85.8	87.7	Lower Michigan.....	87.1	81.3	84.6
Eastern Pennsylvania.....	85.1	82.9	86.0	Upper Michigan.....	84.8	77.7	82.0
Western Pennsylvania.....	80.0	81.6	86.6	Wisconsin.....	93.2	83.5	89.3
New Jersey.....	86.1	83.9	85.2	Minnesota.....	94.2	85.5	90.7
Delaware.....	87.4	90.6	88.7	Iowa.....	95.5	79.4	89.1
Maryland.....	87.4	88.1	87.9	Kansas.....	96.1	83.2	90.9
District of Columbia.....	85.8	87.1	86.3	Nebraska.....	96.1	79.4	89.4
Virginia.....	92.3	73.2	84.7	Missouri.....	94.5	85.5	90.9
North Carolina.....	94.8	68.4	84.2	Colorado.....	98.4	82.3	93.3
South Carolina.....	92.6	73.9	85.1	North Dakota.....	92.6	81.3	88.1
Georgia.....	97.1	70.6	86.5	South Dakota.....	93.2	81.3	88.4
Eastern Florida.....	92.3	85.8	89.7	Northern California.....	96.5	87.4	92.9
Western Florida.....	95.5	86.5	91.9	Southern California.....	98.7	89.0	94.8
Alabama.....	97.1	78.7	89.7	Oregon.....	88.1	88.1	88.1
Mississippi.....	96.8	77.4	89.0	Washington.....	89.7	83.5	87.2
Louisiana.....	95.6	91.6	93.9				
Texas.....	95.8	83.5	90.9	Monthly percentage.....	92.4	83.4	88.8

In determining the monthly percentage of weather and temperature combined, the Pacific coast states are not included. The forecasts of temperature in districts east of the Rocky Mountains for October, 1891, were made with reference to the maximum temperature alone; that is, a prediction of warmer or cooler indicated that the maximum temperature of the day designated would be higher or lower than the maximum of the previous day. The monthly percentage of weather and temperature combined is determined by multiplying the percentage of weather by 6, and the percentage of temperature by 4, and dividing their sum by 10.

STATE WEATHER SERVICES.

[Temperature in degrees Fahrenheit; precipitation, including melted snow, in inches and hundredths.]

The following extracts and summaries are republished from reports for October, 1891, of the directors of the various state weather services:

ALABAMA.

Temperature.—The mean was 4.1 below the normal; maximum, 96, at Salem, 2d; minimum, 23, at Valley Head, 23d and 28th; greatest monthly range, 66, at Brewton; least monthly range, 38, at Citronelle.

Precipitation.—The average was 2.24 below the normal; greatest monthly, 1.83, at Tusculumbia; least monthly, 0.00, at nearly all stations in the state.

Wind.—Prevailing direction, northwest—*P. H. Mell, Observer, Weather Bureau, Auburn, director.*

ARIZONA.

The month was exceedingly dry and warm.

Temperature.—Maximum, 102, at Yuma, 9th; minimum, 24, at Holbrook, 14th.

Precipitation.—The only precipitation reported was a trace at Mount Huachuca.

Wind.—Prevailing direction, southeast.—*J. C. Hayden, Observer, Weather Bureau, Tucson, director.*

ARKANSAS.

Temperature.—The mean was 1.1 below the normal; maximum, 92, at Hot Springs, Monticello, and Newport, 1st, at Black Rock, 24th, and at Lonoke, 25th; minimum, 27, at Devalls Bluff, 23d and 29th; greatest monthly range, 63, at Devalls Bluff; least monthly range, 41, at Winslow.

Precipitation.—The average was 1.51 below the normal; greatest monthly, 2.54, at Pine Bluff; least monthly, 0.00, at Texarkana and Mount Nebo.

Wind.—Prevailing direction, north.—*M. F. Locke, Commissioner of Agriculture, Little Rock, director; F. H. Clarke, Observer, Weather Bureau, assistant.*

CALIFORNIA.

Temperature.—Maximum, 98, at Needles, 7th, 9th, and 11th; greatest monthly range, 61, at Nordhoff; least monthly range, 23, at Stockton.

Precipitation.—Greatest monthly, 4.94, at Upper Mattole; least monthly, 0.00, at a number of stations.

Wind.—Prevailing directions, west and northwest.—*J. A. Barwick, Observer, Weather Bureau, Sacramento, director.*

COLORADO.

Temperature.—The month was slightly warmer than usual; maximum, 88, at Rocky Ford, 28th; minimum, 4, at Climax, 3d.

Precipitation.—The average was deficient; greatest monthly, 3.27, at Platora; 0.00 was reported at a number of stations.—*W. S. Miller, Observer, Weather Bureau, Denver, director.*

FLORIDA.

Temperature.—Maximum, 94, at Archer, 7th; minimum, 32, at Archer, 24th.

Precipitation.—The greatest amount of rain fell in the central and eastern portions of the peninsula, while but little is reported in the western counties; greatest monthly, 9.58, at Fort Meade; least monthly, 0.04, at Pensacola.—*E. R. Demain, Observer, Weather Bureau, Jacksonville, director.*

GEORGIA.

Temperature.—Maximum, 92, at Poulan, 5th; minimum, 30, at Gainesville, 28th; greatest monthly range, 60, at Poulan; least monthly range, 44, at Griffin and West Point.

Precipitation.—Greatest monthly, 2.46, at Savannah; least monthly, 0.00,

at a number of stations.—*Park Morrill, Observer, Weather Bureau, Atlanta, director.*

ILLINOIS.

Temperature.—The mean was 0.5 below the normal of the last 16 years; maximum, 95, at Greenville, 1st; minimum, 18, at Philo, 28th.

Precipitation.—The average was 2.05 below the normal; greatest monthly, 2.59, at Centralia; least monthly, 0.39, at Sandwich.

Wind.—Prevailing direction, northwest.—*John Craig, Observer, Weather Bureau, Springfield, director.*

INDIANA.

Temperature.—Maximum, 92, at Marengo, 1st; minimum, 18, at Mauzy, 28th; greatest monthly range, 69, at Point Isabel; least monthly range, 49, at Shelbyville.

Precipitation.—Greatest monthly, 2.17, at Rockville; least monthly, 0.28, at Vevay.

Wind.—Prevailing direction, northwest.—*Prof. H. A. Huston, La Fayette, director; C. F. R. Wappenhans, Observer, Weather Bureau, assistant.*

IOWA WEATHER AND CROP SERVICE.

Temperature.—Maximum, 92, at Bonaparte, 1st and 2d, and at Moorar, 2d; minimum, 19, at Atlantic and Lafayette, 22d; greatest monthly range, 67, at Moorar; least monthly range, 43, at Grinnell and Independence.

Precipitation.—Greatest monthly, 6.53, at Panama; least monthly, 0.85, at McCausland.—*J. R. Sage, Des Moines, director; G. M. Chappel, Observer, Weather Bureau, assistant.*

KANSAS.

Temperature.—Maximum, 98, at Columbus, 26th; minimum, 20, at Lebo, 22d; greatest monthly range, 73, at Lebo; least monthly range, 49, at Weskan.

Precipitation.—Greatest monthly, 6.14, at Concordia (near); least monthly, trace, at Page City.

Wind.—Prevailing direction, south.—*Prof. J. T. Lovewell, Topeka, director; T. B. Jennings, Observer, Weather Bureau, assistant.*

KENTUCKY.

Temperature.—The mean was 4.0 below the normal; maximum, 92, at Franklin, 1st; minimum, 21, at Harrodsburgh, 28th; greatest monthly range, 68, at Harrodsburgh and Princeton; least monthly range, 54, at Bowling Green.

Precipitation.—The average was 2.25 below the normal; greatest monthly, 1.60, at Harrodsburgh; least monthly, 0.16, at Caddo and Pellville.

Wind.—Prevailing direction, southwest.—*Prof. E. H. Mark, Louisville, director; Frank Burke, Observer, Weather Bureau, assistant.*

LOUISIANA.

Temperature.—The mean was about 4.0 below the normal; maximum, 96, at Cameron, 3d; minimum, 26, at Winnsborough, 19th; greatest monthly range, 67, at Winnsborough; least monthly range, 26, at Port Eads.

Precipitation.—Greatest monthly, 3.07, at Jackson; least monthly, 0.00, at Homer, Liberty Hill, Winnsborough, Amite City, and Shell Beach.

Wind.—Prevailing direction, north.—*George E. Hunt, Observer, Weather Bureau, New Orleans, director.*

MARYLAND.

Temperature.—Maximum, 86, at Mount Saint Marys, 3d; minimum, 27, at McDonogh, 29th; greatest monthly range, 57, at Mount Saint Marys; least monthly range, 36, at Jewell.

Precipitation.—Greatest monthly, 4.83, at Barren Creek Springs; least monthly, 1.79, at Frederick.

Wind.—Prevailing direction, northwest.—*Dr. William B. Clark, Johns Hopkins University, Baltimore, director; Prof. Milton Whitney, Maryland Agricultural College, secretary and treasurer; C. P. Cronk, Observer, Weather Bureau, in charge.*

MICHIGAN.

Temperature.—The mean was 1.1 below the normal; maximum, 89, at Otsego, 2d; minimum, 9, at Crystal Falls, 31st; greatest monthly range, 69, at Gaylord; least monthly range, 38, at Bell Branch.

Precipitation.—The average was 1.45 below the normal; greatest monthly, 4.28, at Charlevoix; least monthly, 0.35, at Williamston.

Wind.—Prevailing directions, northwest and southwest.—*N. B. Conger, Observer, Weather Bureau, Detroit, director.*

MINNESOTA.

Temperature.—Maximum, 81, at Montevideo, 1st; minimum, 17, at Kinbrae, 27th; greatest monthly range, 57, at Montevideo; least monthly range, 43, at Duluth.

Precipitation.—Greatest monthly, 4.13, at Grand Meadow; least monthly, 0.64, at Pine River Dam.

Wind.—Prevailing direction, northwest.—*J. H. Harmon, Observer, Weather Bureau, Minneapolis, director.*

MISSISSIPPI.

Temperature.—The mean was 3.6 below the normal; maximum, 99, at Louisville, 1st; minimum, 26, at Vaiden, 23d; greatest monthly range, 72, at Louisville; least monthly range, 31, at Bay Saint Louis.

Precipitation.—The average was 1.92 below the normal; greatest monthly, 3.40, at Logtown; least monthly, 0.00, at a number of stations.

Wind.—Prevailing direction, north.—*R. B. Fulton, Observer, Weather Bureau, University, director.*

MISSOURI.

Temperature.—The average was 3.0 above the normal; maximum, 98, at Oak Ridge, 26th; minimum, 19, at Adrian, 14th.

Precipitation.—The average was 2.04 below the normal; greatest monthly, 1.98, at Appleton City; least monthly, 0.15, at Brunswick.—*Levi Chubbuck, Secretary of State Board of Agriculture, Columbia, director.*

NEBRASKA.

Temperature.—The mean was slightly below the normal; maximum, 92, at Superior; minimum, 17, at Kimball and Fort Niobrara.

Precipitation.—Greatest monthly, 6.40, at Fort Omaha; least monthly, 0.09, at Kimball.

Wind.—Prevailing direction, northwest.—*Prof. Goodwin D. Swezey, Crete, director; G. A. Loveland, Observer, Weather Bureau, assistant.*

NEVADA.

Temperature.—The mean was 1.2 below the normal; maximum, 88, at Wabuska, 10th; minimum, 0 (zero), at Elko and Stofiel, 12th; greatest monthly range, 81, at Elko; least monthly range, 42, at Hot Springs.

Precipitation.—The average was 0.50 below the normal; greatest monthly, 0.34, at Austin; least monthly, 0.00, at a number of stations.—*Prof. Charles W. Friend, Carson City, director; F. A. Carpenter, Observer, Weather Bureau, assistant.*

NEW ENGLAND METEOROLOGICAL SOCIETY.

Temperature.—The mean was 0.7 below the normal; maximum, 91, at Taunton (d), 4th; minimum, 10, at Berlin Mills, 29th; greatest monthly range, 76, at Stratford; least monthly range, 32, at Nantucket.

Precipitation.—The average was 0.24 above the normal; greatest monthly, 10.14, at Cotuit; least monthly, 0.51, at Lunenburg.

Wind.—Prevailing direction, northwest.—*Prof. William H. Niles, Boston, Mass., president; Prof. Winslow Upton, Providence, R. I., secretary; J. Warren Smith, Observer, Weather Bureau, assistant.*

NEW JERSEY.

Temperature.—The mean was 1.5 below the normal; maximum, 93, at Belvidere, 3d; minimum, 18, at Blairstown, 29th; greatest monthly range, 70, at Belvidere; least monthly range, 51, at Newton and Cape May C. H.

Precipitation.—The average was 2.89 below the normal; greatest monthly, 5.57, at Cape May C. H.; least monthly, 1.88, at Newton.

Wind.—Prevailing direction, northwest.—*E. W. McGann, Observer, Weather Bureau, New Brunswick, director.*

NEW MEXICO.

Temperature.—Maximum, 96, at Folsom, 19th; minimum, 13, at Coolidge, 31st; greatest monthly range, 69, at Coolidge; least monthly range, 39, at Santa Fé.

Precipitation.—Greatest monthly, 0.64, at Coolidge; least monthly, 0.00, at a number of stations.

Wind.—Prevailing direction, southwest.—*H. B. Hersey, Observer, Weather Bureau, Santa Fé, director.*

NEW YORK.

Temperature.—The mean was 0.8 below the normal; maximum, 91, at Wedgwood, 4th, and at Central Park, 18th; minimum, 14, at South Kortright, 29th; greatest monthly range, 70, at Wedgwood; least monthly range, 37, at Central Park.

Precipitation.—The average was 0.69 below the normal; greatest monthly, 8.35, at Peekskill; least monthly, 0.93, at West Point.

Wind.—Prevailing direction, west.—*Prof. E. A. Fuertes, Dean of the College of Civil Engineering, Cornell University, Ithaca, director; R. M. Hardinge, Observer, Weather Bureau, assistant.*

NORTH CAROLINA.

Temperature.—The mean was 4.0 below the normal; maximum, 92, at Chapel Hill, 5th; minimum, 22, at Bakersville, 29th; greatest monthly range, 64, at Chapel Hill; least monthly range, 34, at Southport.

Precipitation.—The average was 1.66 below the normal; greatest monthly, 7.74, at Hatteras; least monthly, 0.10, at Hendersonville.

Wind.—Prevailing direction, northwest.—*Dr. Herbert B. Battle, Raleigh, director; C. F. von Herrmann, Observer, Weather Bureau, assistant.*

NORTH DAKOTA.

Temperature.—The mean was about 2.0 above the normal; maximum, 80, at Fort Yates, 29th; minimum, 15, at Fort Buford, 3d; greatest monthly range, 62, at Woodbridge; least monthly range, 47, at Hope.

Precipitation.—The average was 0.30 above the normal; greatest monthly, 3.56, at Valley City; least monthly, 0.83, at Woodbridge.

Wind.—Prevailing direction, northwest.—*W. H. Fallon, Observer, Weather Bureau, Bismarck, director.*

OHIO.

Temperature.—The average was normal except in the northern section, where it was 1.0 above; maximum, 93, at Bangorville, 2d; minimum, 20, at Wauseon, Findlay, and Granville, 28th.

Precipitation.—The average was 0.89 below the normal; greatest monthly, 3.72, at Marion; least monthly, 0.54, at Demos.

Wind.—Prevailing direction, southwest.—*Prof. B. F. Thomas, Columbus, director; C. M. Strong, Observer, Weather Bureau, secretary and assistant.*

OREGON.

Temperature.—The mean was above the normal; maximum, 89, at Grants Pass, 7th, and at Lakeview, 8th; minimum, 11, at Burns, 30th.

Precipitation.—The average was 0.39 above the normal; snow fell at Beulah, Joseph, and on the high plateaus and mountains of Oregon.

Wind.—Prevailing direction, south.—*Hon. H. E. Hayes, Master State Grange, Portland, director; B. S. Pague, Observer, Weather Bureau, asst.*

PENNSYLVANIA.

Temperature.—The mean was 1.5 below the normal; maximum, 91, at Carlisle, 3d; minimum, 16, at Dyberry, 29th; greatest monthly range, 69, at Coatesville and Dyberry; least monthly range, 47, at Altoona.

Precipitation.—The average was 0.25 below the normal; greatest monthly, 4.46, at Selins Grove; least monthly, 0.84, at New Castle.

Wind.—Prevailing direction, northwest.—*Under direction of the Franklin Institute, Philadelphia; L. M. Dey, Observer, Weather Bureau, assistant.*

SOUTH CAROLINA.

Temperature.—Maximum, 92, at Greenwood, 5th; minimum, 28, at Kingstree and Kitchings Mills, 29th; greatest monthly range, 62, at Greenville and Kingstree; least monthly range, 42, at Port Royal.

Precipitation.—Greatest monthly, 4.20, at Charleston; least monthly, 0.18, at Spartanburgh.

Wind.—Prevailing directions, north and northeast.—*A. P. Butler, Observer, Weather Bureau, Columbia, director.*

SOUTH DAKOTA.

Temperature.—The mean was 2.0 above the normal; maximum, 95, at Forest City, 24th; minimum, 11, at Oelrichs, 2d; greatest monthly range, 75, at Forest City; least monthly range, 54, at Pierre.

Precipitation.—The average was 0.40 below the normal; greatest monthly, 1.88, at Aberdeen; least monthly, 0.34, at Rapid City.

Wind.—Prevailing direction, northwest.—*S. W. Glenn, Observer, Weather Bureau, Huron, director.*

TENNESSEE.

The most marked feature of the month was the small amount of rainfall.

Temperature.—The mean was 0.4 below the normal; maximum, 94, at Arlington, 1st, and with one exception, 1884, was the highest maximum on record for October; minimum, 24, at Austin and Hohenwald, 23d.

Precipitation.—The average was 1.80 below the normal, and was the least amount on record; the rainfall was greatest in the western part and least along the eastern border.—*J. B. Marbury, Observer, Weather Bureau, Nashville, director.*

TEXAS.

Temperature.—The mean was generally below the normal except in the west part and in the Panhandle; maximum, 98, at Dallas, 3d; minimum, 30, at Dallas, 8th; greatest monthly range, 68, at Dallas; least monthly range, 28, at Galveston.

Precipitation.—The average was below the normal except in the Panhandle; greatest monthly, 8.33, at Hartley; 0.00 was reported at a number of stations in the central part of the state.—*D. D. Bryan, Galveston, director; I. M. Cline, Observer, Weather Bureau, assistant.*

UTAH.

Temperature.—Maximum, 90, at Saint George, 9th and 10th; minimum, 12th, at Scofield, 30th and 31st; greatest monthly range, 67, at Beaver; least monthly range, 40, at Snowville.

Precipitation.—No appreciable rain fell after the 2d of the month; greatest monthly, 1.26, at Salt Lake City; least monthly, 0.00, at a number of stations.—*G. N. Salisbury, Observer, Weather Bureau, Salt Lake City, director.*

VIRGINIA.

Temperature.—The mean ranged from 2.0 to 3.0 below the normal; maximum, 92, at Richmond, 3d, and at Nottoway C. H., 5th; minimum, 22, at Big Stone Gap, 28th; greatest monthly range, 64, at Richmond; least monthly range, 48, at Salem.

Precipitation.—Greatest monthly, 11.55, at Birdsnest; least monthly, 0.24, at Bedford City.—*Dr. E. A. Craighill, Lynchburgh, director; J. N. Ryker, Observer, Weather Bureau, assistant.*

WASHINGTON.

Temperature.—Maximum, 89, at North Yakima, 7th; minimum, 18, at Waterville, 13th and 15th; greatest monthly range, 66, at North Yakima; least monthly range, 23, at East Sound.

Precipitation.—The average was in excess of the normal in the western part of the state, except at lower Sound points and Tatoosh Island, and it was deficient in the eastern part; greatest monthly, 10.06, at Neah Bay; least monthly, 0.16, at Baker City, Oregon.

Wind.—Prevailing direction, south.—*E. B. Olney, Observer, Weather Bureau, Olympia, director.*

WEST VIRGINIA.

Temperature.—Maximum, 95, at Morgantown, 3d; minimum, 24, at Parkersburgh and Pleasant Hill, 28th.

Precipitation.—Greatest monthly, 2.91, at Martinsburgh; least monthly, trace, at Kingwood.—*W. W. Dent, Observer, Weather Bureau, Parkersburgh, director.*

WISCONSIN.

Temperature.—Maximum, 90, at Beaver Dam, 1st, and at Juneau, 2d; minimum, 14, at Hayward, 27th.

Precipitation.—In the extreme northwest, northeast, and southern parts of the state there was a deficiency of from 1.00 to 2.00; elsewhere it was above the normal; greatest monthly, 4.29, at Whitehall; least monthly, 0.18, at Cadiz.—*W. L. Moore, Observer, Weather Bureau, Milwaukee, director.*

WYOMING.

Temperature.—The mean was about normal; maximum, 88, at Casper, 26th, and at Fort Fetterman, 17th; minimum, 9, at Saratoga, 31st; greatest monthly range, 69, at Fort Fetterman; least monthly range, 51, at Fort McKinney and Laramie.

Precipitation.—The average was below the normal; greatest monthly, 1.50, at Lander; least monthly, 0.00, at Wheatland.

Wind.—Prevailing direction, northwest.—*E. M. Ravenscraft, Observer, Weather Bureau, Cheyenne, director.*

CONTRIBUTIONS AND ORIGINAL ARTICLES.

FLUCTUATIONS OF TEMPERATURE AND PRESSURE AT THE BASE AND SUMMIT OF MOUNT WASHINGTON.

[By Prof. H. A. HAZEN, Weather Bureau.]

The last chart in this REVIEW contains a continuation of the curves previously published, and completes these fluctuations for the months of January, February, and March from 1871 to 1886, or for 16 years.

1st. An interesting question arises as to the effect of the mountain upon the temperature of the air. The curves seem to show that if there is any effect it is exceedingly slight and cannot influence the maximum and minimum points, except to prevent the extreme rise and fall in warm and cold waves that might occur in the free air. In other words, the temperature in a warm wave might not rise quite so high if the summit were cooler than the air and might not fall quite so low in a cold wave if the summit rocks were warmer than the air. It would appear that, under any and all circumstances, the dips and rises in the fluctuations of temperature at the summit would not be shifted appreciably in time of occurrence by the presence of the mountain.

2d. Is the diurnal range entirely eliminated from the base curve? It will be noted that the base curve shows a great many minor fluctuations of temperature not to be found in the summit curve, and a close inspection will show that many of these are due to the diurnal range. For example, with a clouded sky the diurnal range has been over compensated, since the clouds prevent

radiation at night and insolation by day. These cases, however, are very few and the effects are not sufficiently strong to obliterate the larger fluctuations.

3d. As was to be expected the fluctuations of pressure are almost exactly identical at the base and summit. Occasionally the change in temperature at the summit has preceded that in pressure to such an extent as to cause the pressure phases to lag behind at the summit.

4th. As has been noted before, the most marked characteristic in the temperature curves has been their closeness at base and summit, indicating, apparently, a general effect not essentially modified by local causes. The earlier change at the summit in both cold waves and hot waves is remarkable and does not seem to be due, as has been suggested, to the greater rapidity of the upper current which carries the warm or cold air from the west more rapidly to the summit than to the base. It will be seen that any effect of this kind would be very quickly obliterated by the motion of the air. Again, while on some accounts warm air from the earth's surface might produce such an effect, it would seem that cold air could not have this source, but must come from above.

Observations are much needed at very much greater heights, even up to 30,000 feet, in order to settle these and many other questions. These curves have been published in order to bring the material contained in them before others, and it is hoped that many will be interested in making them a special study.

Meteorological record of Army post surgeons, voluntary, and other co-operating observers, October, 1891.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean.			Max.	Min.	Mean.	
Alabama.	o	o	o	Ins.	Arkansas—Cont'd.	o	o	o	Ins.
Athens	77	37	55.8	0.42	Fayetteville	91	30	58.1	0.58
Bermuda	87	33	60.7	T.	Forrest City	89	34	62.8	0.07
Bessemer	92	30	61.0	0.04	Fulton	88	31	62.1	0.12
Brewton	95	29	62.3	0.00	Gaines Landing	88	31	62.1	0.12
Childersburgh	85	46	65.5	0.18	Harrisburg	88	31	62.1	0.12
Citronelle	85	46	65.5	0.18	Helena (1)	89	35	60.7	0.12
Cordova	88	26	57.4	0.39	Helena (2)	85	37	61.1	0.52
Decatur (1)	88	26	57.4	0.39	Hope	92	33	61.0	0.50
Decatur (2)	84	34	61.1	0.02	Lead Hill	92	34	62.3	0.25
Double Springs	90	30	62.2	0.05	Lonoke	88	38	62.4	0.26
Eufaula (2)	87	34	60.6	0.00	Malvern	92	35	64.8	0.40
Evergreen	87	34	60.6	0.00	Monticello	83	39	61.0	0.00
Florence (1)	85	23	58.2	0.00	Mount Nebo	92	32	61.9	0.49
Florence (2)	87	30	62.8	0.00	Newport (1)	88	32	57.9	0.00
Fort Deposit	87	30	62.8	0.00	Newport (2)	91	33	60.0	0.42
Gadsden	87	30	62.8	0.00	Ozark	84	39	58.4	0.05
Greensborough	90	42	65.3	0.23	Paragould	87	34	57.0	0.54
Guntersville	92	47	69.6	0.60	Pine Bluff	91	33	61.7	0.25
Jasper	89	27	56.3	0.31	Prescott	85	37	62.0	0.25
Livingston (1)	85	32	59.0	T.	Rogers	89	29	57.1	0.02
Livingston (2)	89	29	59.8	0.02	Stuttgart	86	30	58.8	0.43
Lynn	82	35	57.3	0.48	Texarkana	89	28	62.6	0.00
Maysville	88	25	57.5	1.52	Winslow	80	39	60.3	0.86
Mountain Home	88	25	57.5	1.52	California.				
Mount Willing	88	25	57.5	1.52	Alameda	90	48	65.0	0.00
MT. Vernon B'ks.	90	38	63.6	0.00	Alcatraz Island	82	41	50.5	0.39
Opelika	86	34	61.1	T.	Almaden	87	41	61.4	0.21
Orrville	90	32	61.8	0.00	Anaheim	88	50	67.5	0.00
Oxanet	85	30	60.0	0.20	Angel Island	89	38	59.7	0.15
Pine Apple	89	48	63.8	0.00	Antioch	86	50	66.4	0.07
Pittsborough	85	40	61.6	0.00	Aptos	90	37	57.8	0.00
Pueblita	86	32	61.6	0.00	Arcata	97	40	67.7	1.13
Selma (1)	86	32	61.6	0.00	Auburn	98	44	66.4	0.00
Selma (2)	86	32	61.6	0.00	Bakersfield	93	50	69.3	0.00
Scottsborough	82	27	54.4	0.00	Ballast Point L. H.	90	34	65.4	0.00
Sturdevant	82	27	54.4	0.00	Barstow	90	34	65.4	0.00
Talladega	82	27	54.4	0.00	Beaumont	98	52	67.8	0.00
Tallapoosa Falls	82	27	54.4	0.00	Belmont	79	41	62.4	0.00
Thomasville	82	27	54.4	0.00	Benicia Barracks	85	45	61.6	0.03
Tuscaloosa	82	27	54.4	0.00	Berendo	95	50	68.8	0.22
Tusculum (1)	82	27	54.4	0.00	Berkeley	82	46	58.4	0.00
Tusculum (2)	82	27	54.4	0.00	Bishop Creek	84	43	63.9	0.00
Union Springs	82	27	54.4	0.00	Boca	90	18	48.1	0.00
Uniontown	82	27	54.4	0.00	Borden	92	43	64.8	0.00
Valley Head	82	27	54.4	0.00	Boulder Creek	94	29	56.5	0.03
Alaska.	59	29	43.0	11.19	Brentwood	88	44	65.0	0.00
Arizona.					Brighton	93	53	67.8	0.15
Aria, Can. Co. Dam.	98	45	75.7	0.00	Byron	84	48	66.6	0.05
Benson	82	40	62.7	0.00	Caliente	90	50	66.1	0.00
Buckeye	82	40	62.7	0.00	Calistoga	88	44	61.7	0.30
Calabasas	82	40	62.7	0.00	C. Mendocino L. H.	76	41	59.1	0.12
Casa Grande	101	56	78.5	0.00	Castroville	93	50	69.3	0.00
Dos Cabezas	82	40	62.7	0.00	Chico	91	55	71.1	0.34
Dragoon Summit	82	40	62.7	0.00	Cisco	70	28	50.4	1.00
Eagle Pass	82	40	62.7	0.00	Colfax	93	42	63.1	0.40
Farley's Camp	82	40	62.7	0.00	Colton	90	42	65.0	0.00
Flagstaff	82	40	62.7	0.00	Corning	93	44	64.6	0.50
Florence	82	40	62.7	0.00	Crescent City	88	44	64.8	0.00
Fort Apache	82	40	62.7	0.00	Crescent City L. H.	88	44	64.8	0.00
Fort Bowie	82	40	62.7	0.00	Delano	96	46	69.1	0.24
Fort Grant	82	40	62.7	0.00	Downey	90	38	63.5	0.00
Fort Huachuca	82	40	62.7	0.00	Dunsmuir	86	50	68.0	0.00
Fort Mohave	102	49	73.3	0.00	East Brother L. H.	87	38	56.9	2.13
Gila Bend (1)	90	60	78.3	0.00	Edgewood	76	28	51.8	0.43
Gila Bend (2)	106	54	80.6	0.00	El Casco	94	47	69.6	0.00
Grand Central Mill	80	24	52.2	0.00	El Dorado	96	46	65.2	0.85
Holbrook	80	24	52.2	0.00	Elmira	86	50	66.5	0.00
Maricopa (1)	82	40	62.7	0.00	El Verano	84	40	61.5	0.28
Maricopa (2)	82	40	62.7	0.00	Emigrant Gap	72	30	52.2	0.20
Mount Huachuca	82	40	62.7	0.00	Esparto	89	49	68.5	0.20
Oracle	83	43	68.8	0.00	Evergreen	87	43	65.5	0.08
Pantano	93	55	69.3	0.00	Farmington	82	43	65.5	0.08
Payson	93	55	69.3	0.00	Felton	92	36	58.2	0.42
Red Rock	93	55	69.3	0.00	Fernando	95	51	69.5	0.00
Saint John	93	55	69.3	0.00	Florence	91	50	63.0	0.00
San Carlos	98	34	66.8	0.00	Folsom	95	45	68.0	0.19
San Simon	94	44	68.8	0.00	Fort Bidwell	79	22	52.0	0.20
Show Low	94	44	68.8	0.00	Fort Gaston	86	31	54.7	3.47
Signal	95	41	70.6	0.00	Fort Mason	79	27	50.0	0.04
Strawberry	95	41	70.6	0.00	Fresno	88	62	77.5	0.00
Teviston	95	41	70.6	0.00	Fruto	90	44	65.8	0.00
Texas Hill	105	55	76.0	0.00	Galt	90	58	66.8	1.80
Tombstone	90	45	67.3	0.00	Georgetown	86	38	62.2	0.07
Tucson (1)	92	40	70.6	0.00	Gilroy	84	40	62.4	0.07
Tucson (2)	91	39	73.7	0.00	Girard	84	40	62.4	0.07
Walnut Grove	91	39	73.7	0.00	Glen Ellen	88	35	61.5	0.36
Walnut Ranch	91	39	73.7	0.00	Goshen	90	36	67.3	1.00
Willcox	90	50	70.5	0.00	Grass Valley	80	41	58.3	0.23
Wilgus	90	50	70.5	0.00	Haywards	80	41	58.3	0.23
Woodruff	90	50	70.5	0.00	Hollister	95	40	61.9	0.00
Yuma	98	60	75.4	0.00	Hornbrook	85	32	58.0	0.65
Arkansas.					Humboldt L. H.	95	43	69.5	0.00
Arkadelphia	82	40	62.7	0.00	Huron	79	38	56.3	1.74
Arkansas City	82	40	62.7	0.00	Hydesville	106	56	78.1	0.00
Black Rock	82	40	62.7	0.00	Indio	106	56	78.1	0.00
Brinkley	88	30	58.8	0.00					
Camden	88	30	58.8	0.00					
Conway	88	30	58.8	0.00					
Corner Stone	88	30	58.8	0.00					
Dallas	88	30	58.8	0.00					
Dardanelle	88	30	58.8	0.00					
Deerall Bluff	88	30	58.8	0.00					
El Dorado	88	30	58.8	0.00					

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean.			Max.	Min.	Mean.	
California—Cont'd.	o	o	o	Ins.	California—Cont'd.	o	o	o	Ins.
Ione	89	40	61.6	0.45	Santa Cruz (2)	89	38	58.9	0.45
Iowa Hill	87	47	64.0	0.98	Santa Cruz L. H.	89	38	58.9	0.45
Jolon	84	33	63.1	0.14	Santa Margarita	85	32	55.1	0.00
Juliant	84	33	63.1	0.00	Santa Maria	82	52	64.1	0.00
Keeler	81	43	64.9	0.04	Santa Monica	90	48	62.7	0.00
Keene	88	46	61.1	0.00	Santa Paula	87	38	59.9	0.20
King City	95	34	61.3	0.00	Santa Rosa	90	43	65.6	0.00
Kingsburg	95	45	69.4	0.00	Selma	106	61	81.6	0.00
Knights Landing	93	42	62.1	0.00	Seven Palms	85	31	55.4	2.84
Lathrop	93	42	62.1	0.00	Shasta Springs	83	49	64.2	0.70
Laurel	90	35	62.4	0.55	Shingle Springs	83	49	64.2	0.70
Lemoore	94	41	62.6	0.00	Sims	85	35	58.5	4.08
Lime Point L. H.	92	39	61.6	0.22	Sisson	85	35	58.5	0.30
Livermore	92	39	61.6	0.05	Soledad	85	35	58.5	0.30
Livingston	98	45	66.4	0.11	Sonoma	84	39	61.8	0.20
Long Beach	98	45	66.4	0.11	Sonoma	84	39	61.8	0.20
Lodi	98	45	66.4	0.11	Sonoma	84	39	61.8	0.20
Los Angeles	89	37	63.4	0.18	S. E. Farrallon L. H.	88	40	59.2	1.30
Los Banos	84	52	66.4	0.08	South Vallejo	85	49	62.4	0.00
Los Gatos (1)	85	39	59.9	0.12	Spadra	98	44	66.0	0.00
Los Gatos (2)	84	39	59.9	0.03	Steeles	92	42	62.3	0.24
Mammoth Tank	108	62	81.7	0.00	Stockton (1)	77d	54d	65.5	0.05
Mare Island L. H.	89	40	58.3	0.13	Stockton (2)	79	40	64.0	0.05
Martinez	89	40	58.3	0.13	Summit	70	30	50.7	0.05
Marysville (1)	89	40	58.3	0.13	Suisun City	90	40	64.0	0.05
Marysville (2)	89	40	58.3	0.13	Susanville	74	30	51.7	0.45
Menlo Park	87	41	60.8	0.20	Tehachapi	80	35	59.7	0.50
Merced	104	39	70.8	0.02	Tehama	90	50	67.5	0.00
Milton (near)	86	47	63.6	0.12	Templeton	83	34	61.4	0.00
Modesto	92	52	72.6	0.03	Towles	86	38	58.7	1.72
Mohave	91	41	67.6	0.03	Tracy	85	45	64.8	0.16
Monson	91	41	67.6	0.03	Traver	89	42	63.9	0.16
Montague	93	48	65.2	0.20	Trinidad L. H.	89	42	63.9	0.16
Monterey	93	48	65.2	0.20	Tropic	92	50	66.1	

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
<i>Colorado—Cont'd.</i>					<i>Georgia—Cont'd.</i>				
Kia Carson.....	82	36	48.8	0.00	Diamond.....	80	28	61.1	0.95
Lamar.....	85	35	53.6	0.16	Eastman.....	85	34	59.8	0.33
La Porte.....	83	34	53.0	0.20	Forayth.....	82	42	64.4	0.15
Las Animas.....	83	34	53.0	0.20	Fort Gaines.....	88	27	59.6	0.27
Lay.....	80	32	56.0	0.00	Gainesville.....	83	30	57.3	0.00
Le Roy.....	79	32	49.4	0.14	Gillville.....	83	35	61.0	0.00
Leslie.....	80	32	56.0	0.00	Griffin.....	83	36	60.8	0.00
Livermore.....	68	20	44.1	0.97	Hephzibah.....	85	49	63.7	0.45
Loveland.....	80	32	56.0	0.00	Macon.....	88	38	64.4	0.20
Magnolia.....	80	32	56.0	0.00	Marietta.....	84	31	57.5	0.26
Manhattan.....	80	32	56.0	0.00	Milledgeville.....	82	31	60.8	0.31
Middle Box Elder.....	80	32	56.0	0.00	Monticello.....	84	28	61.0	1.48
Monte Vista (1).....	63	18	41.8	0.21	Newnan.....	81	35	59.4	0.00
Moraine.....	69	15	43.8	0.31	Point Peter.....	80	29	59.7	0.10
Pagoda (near).....	79	15	44.0	0.14	Quitman (1).....	86	41	62.4	1.65
Parachute.....	74	34	50.0	0.01	Quitman (2).....	90	36	65.8	0.00
Platoro.....	55	9	34.7	3.27	Resaca.....	90	36	65.8	0.12
Red Cliff.....	80	32	56.0	0.00	Rome.....	80	28	59.4	0.28
Rico.....	80	32	56.0	0.00	Thomasville (2).....	83	33	65.4	1.09
River Bend.....	80	32	56.0	0.00	Toccoa.....	84	32	62.4	0.15
Robb.....	82	33	52.4	0.07	Union Point.....	82	34	61.5	0.16
Rocky Ford.....	82	34	53.2	0.01	Washington.....	87	34	60.6	0.00
Saint Cloud.....	80	32	56.0	0.00	Way Cross.....	86	34	63.6	1.08
Sanborn.....	80	32	56.0	0.00	Waynesborough.....	91	32	62.0	0.86
San Luis.....	78	16	45.9	0.44	West Point.....	84	40	63.6	0.00
Sedgwick.....	80	32	56.0	0.00	<i>Idaho.</i>				
Sheridan Lake.....	79	32	52.0	0.23	American Falls.....	73	17	44.9	0.35
Smoky Hill Mine.....	80	17	50.0	0.71	Boise Barracks.....	81	24	54.0	0.02
Springfield.....	80	32	56.0	0.00	Fort Sherman.....	78	26	50.6	1.29
Stamford.....	80	32	56.0	0.00	Henry's Lake.....	68	12	38.4	0.55
Steamboat Springs.....	75	15	46.5	0.46	Kootenai.....	77	20	45.1	1.11
Surface Creek.....	72	22	47.2	0.00	Ruthberg.....	89	40	55.4	0.45
Table Rock.....	69	19	45.4	0.88	<i>Illinois.</i>				
T. S. Ranch.....	73	26	50.5	0.00	Alton.....	88	22	49.5	0.68
Thon.....	84	30	51.9	0.49	Aurora (1).....	88	22	49.5	0.68
Twin Lakes.....	80	32	56.0	0.00	Aurora (2).....	91	25	50.2	0.92
Vilas.....	80	32	56.0	0.00	Beardstown.....	87	24	51.3	0.73
Waterville.....	80	32	56.0	0.00	Benson.....	92	32	54.9	0.94
Windsor.....	80	32	56.0	0.00	Carlinville.....	90	30	54.0	0.59
Wray.....	80	32	56.0	0.00	Centralia.....	88	28	52.0	1.47
Yuma.....	80	32	56.0	0.05	Charleston.....	88	28	52.0	1.47
<i>Connecticut.</i>					Chester.....	88	28	52.0	1.47
Canton.....	83	30	50.4	3.65	East Peoria.....	88	28	52.0	1.47
Colchester.....	85	33	50.3	4.05	Fort Sheridan.....	89	27	49.7	1.55
Falls Village.....	85	33	50.3	4.05	Galeton.....	88	28	52.0	1.47
Fort Trumbull.....	85	33	50.3	4.05	Galeton.....	88	28	52.0	1.47
Hartford (2).....	85	33	50.3	4.05	Greenville.....	95	29	53.4	1.57
Lake Konomoc.....	85	33	50.3	4.05	Griggsville.....	91	32	54.6	2.11
Lebanon.....	85	33	50.3	4.05	Hennepin.....	92	31	49.7	1.43
Mansfield.....	84	30	48.3	4.14	Jordan's Grove.....	93	26	55.0	1.93
Middletown.....	83	24	49.3	4.24	Lanark.....	86	26	49.8	1.58
New Hartford (1).....	82	26	45.1	2.21	Louisville.....	88	26	51.1	1.80
New Hartford (2).....	80	35	53.7	3.33	Martinsville.....	86	27	53.8	1.09
N. Grosvener Dale.....	80	35	53.7	3.33	Mascoutah.....	82	26	55.4	1.30
North Woodstock.....	82	26	45.1	2.21	Mattoon.....	84	30	50.5	1.40
Northwalk.....	82	26	45.1	2.21	McLeansborough.....	93	28	55.7	0.55
Southington.....	80	32	48.8	3.05	Mount Carmel.....	80	28	55.4	1.45
South Manchester.....	80	32	48.8	3.05	Olney (1).....	88	28	55.4	1.45
Stevenson.....	80	32	48.8	3.05	Olney (2).....	88	28	55.4	1.45
Thompson.....	80	32	48.8	3.05	Oswego.....	87	22	49.0	0.64
Voluntown.....	83	22	49.6	6.82	Ottawa.....	89	26	51.7	0.56
Wallingford.....	83	22	49.6	6.82	Palmer.....	86	25	51.6	1.38
Waterbury.....	83	22	49.6	6.82	Pana.....	87	30	55.5	2.26
West Simsbury.....	83	22	49.6	6.82	Peoria (1).....	90	30	54.3	0.71
<i>Delaware.</i>					Peoria (2).....	90	30	54.3	0.71
Dover.....	82	29	54.4	3.17	Philo.....	89	18	52.6	0.82
Kirkwood.....	82	29	54.4	3.17	Riley.....	87	28	49.4	1.16
<i>District of Columbia.</i>					Rockford.....	86	28	49.4	1.53
Long Bridge.....	85	33	56.4	2.17	Rock Island Arsenal.....	89	29	52.8	1.47
Washington B'ks.....	85	33	56.4	2.17	Rushville.....	92	31	51.0	2.34
West Washington.....	87	28	55.5	2.45	Sandwich.....	88	22	51.4	0.39
<i>Florida.</i>					Sycamore.....	86	25	49.6	0.80
Amelia.....	94	32	67.9	0.47	Warsaw.....	84	28	55.4	1.39
Archer.....	88	39	68.0	4.41	Winnebago.....	86	30	49.2	1.49
Easton.....	91	43	67.9	3.49	<i>Indiana.</i>				
Fort Barrancas.....	97	34	68.7	0.44	Angola.....	85	30	50.3	1.99
Fort Meade.....	87	42	69.2	0.58	Butlerville.....	85	27	51.2	0.35
Gainesville.....	80	44	66.4	0.44	Columbia City.....	83	29	50.6	1.22
Homeland.....	89	45	71.6	6.35	Columbus.....	84	30	50.6	1.00
Hypoluxo.....	86	60	75.8	3.81	Connersville.....	84	23	52.5	0.67
Manatee.....	90	44	70.1	4.03	De Gonia Springs.....	84	28	54.7	0.66
Merritts Island.....	84	57	72.9	5.39	Delphi.....	82	30	48.9	1.06
Myers.....	86	53	71.1	4.44	Evansville.....	80	28	55.4	1.45
Ocala.....	83	53	66.0	0.00	Farmland.....	84	30	52.2	1.91
Orange City.....	91	37	69.2	7.19	Franklin.....	83	31	52.6	1.32
Passadena.....	88	37	68.1	1.76	Huntington.....	85	29	54.6	0.51
Port Tampa.....	98	35	69.0	1.00	Logansport (1).....	86	22	53.0	1.17
St. Francis B'ks.....	84	45	68.4	4.63	Logansport (2).....	83	24	49.1	1.09
St. Petersburg.....	90	45	69.5	3.93	Marion.....	84	27	55.7	0.31
Tallahassee.....	87	42	65.0	1.00	Manay.....	86	18	51.1	0.77
Tarpon Springs.....	90	40	67.9	1.51	Michigan City.....	85	28	54.5	1.73
<i>Georgia.</i>					Mount Vernon (1).....	80	28	55.4	1.09
Altamaha.....	90	32	64.6	0.41	Mount Vernon (2).....	86	32	54.2	1.09
Allapahat.....	86	30	62.6	1.07	Point Isabel.....	92	23	59.7	1.90
Americus.....	90	30	63.2	0.59	Princeton.....	85	29	54.2	0.95
Athens (2).....	98	26	56.7	0.15	Rockville.....	89	23	54.0	2.17
Bainbridge.....	89	36	65.0	0.00	Rushville.....	89	23	54.0	2.17
Blakely.....	86	40	67.6	0.94					
Camak.....	89	32	60.4	0.41					
Canton.....	84	32	59.5	0.00					
Cartersville.....	81	36	60.4	0.00					
Columbus.....	81	36	60.4	0.00					
Cordele.....	89	26	62.2	0.71					

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
<i>Indiana—Cont'd.</i>					<i>Kansas—Cont'd.</i>				
Seymour.....	84	28	54.9	1.11	Fort Riley.....	91	29	55.0	2.99
Shelbyville.....	82	33	54.3	1.75	Fort Scott.....	87	30	51.4	0.97
Terre Haute.....	86	34	52.6	0.39	Globe.....	87	30	51.4	1.37
Valparaiso.....	86	34	52.6	0.39	Gove City.....	88	30	51.6	0.72
Vevay.....	86	34	52.6	0.39	Grainfield.....	82	30	50.0	0.50
Vincennes.....	81	28	52.1	1.03	Grenola.....	90	34	59.6	0.40
Worthington.....	81	28	52.1	1.11	Grinnell.....	86	34	59.6	0.40
<i>Indian Territory.</i>					<i>Havena.....</i>				
Enfau.....	80	30	57.6	0.25	Horton.....	84	26	52.9	2.18
Fort Supply.....	92	30	57.6	2.33	Hutchinson.....	87	31	55.6	1.46
Healdton.....	85	33	62.4	0.87	Independence.....	92	31	57.3	2.48
South McAlester.....	92	46	66.5	0.87	Kansas City.....	95	28	59.2	0.94
Tulsa.....	92	46	66.5	0.55	Kellough.....	90	28	54.9	1.04
Woodward.....	92	46	66.5	1.00	Kirwin.....	90	25	57.8	1.12
<i>Iowa.</i>					<i>La Harpe.....</i>				
Alta (1).....	75	28	47.6	5.78	Lakin.....	83	22	51.5	0.30
Alta (2).....	75	28	47.6	5.78	Larned.....	83	22	51.5	0.30
Amana.....	84	26	49.7	2.01	Lawrence.....	86	32	54.1	1.35
Ames (2).....	74	23	47.2	2.78	Lebo.....	93	20	55.5	1.08
Atlantic.....	85	19	47.2	3.35	Leoti.....	84	24	52.3	0.00
Bancroft.....	75	22	46.7	4.38	Manhattan (1).....	89	22	53.2	1.96
Belle Plaine.....	78	25	49.5	3.28	Manhattan (2).....	89	22	53.2	2.45
Blakeville.....	82	31	52.2	2.59	Manhattan (3).....	85	24	53.7	2.40
Blockton.....	83	23	50.5	1.57	Manhattan (4).....	84	25	50.6	3.75
Bonaparte.....	92	38	56.8	1.76	McAllister.....	82	32	54.8	0.00
Carroll.....	78	24	48.6	5.60	McPherson.....	80	29	53.8	0.65
Cedar Falls.....	80	24	50.1	2.77	Medicine Lodge.....	80	29	53.8	0.65
Cedar Rapids.....	84	28	49.1	2.44	Minneapolis.....	80	30	51.7	5.20
Charles City.....	85	25	51.5	2.00	Monument.....	83	30	50.0	0.20
Clarinda.....	81	29	52.6	2.78	Morse.....	90	29	53.8	0.65
Clinton.....	88	26	49.7	1.46	Morton.....	87	34	59.4	2.55
College Springs.....	88	36	57.4	2.76	New Eng'd Ranch.....	89	24	53.2	0.41
Corning (1).....	81	24	50.5	1.89	Norton.....	86	30	55.6	1.46
Corning (2).....	81	24	50.5	2.24	Oakley.....	82	32	59.9	1.03
Cresco.....	76	22	46.2	1.95	Oberlin.....	82	32	59.9	1.03
Delaware.....	76	27	46.0	2.83	Ogallah.....	80	28	50.6	1.70
Denison.....	79	27	50.8	5.30	Oswego.....	94	28	58.3	1.95
Elkader.....	80	23	48.4	2.34	Page City.....	80	28	50.6	1.70
Fairfield.....	76	19	47.9	1.76	Phillipsburgh.....	86	28	54.6	0.78
Fayette.....	76	19	47.9	2.27	Plainville.....	86	28	54.6	0.78
Fontanelle.....	76	19	47.9	2.45	Pleasant Dale.....	82	27	51.0	2.65
Fort Madison.....	90	34	56.2	1.76	Rome.....	88	30	57.1	5.13
Galva.....	86	24	51.9	5.75	Salina.....	82	35	55.4	1.19
Glenwood (1).....	90	38	56.4	4.81	Sedan.....	89	30	58.6	0.30
Grand Meadow.....	74	27	48.3	2.02	Seneca.....	85	23	51.0	3.01
Greenfield.....	80	26	50.0	2.37	Sterling.....	85	32	53.0	1.60
Greenville.....	75	21	45.2	4.28	Ulysses.....	85	32	53.0	0.50
Grinnell.....	75	25	51.9	2.34	Wakefield.....	86	32	55.1	3.73
Grundy Centre.....	78	27	49.0	2.75	Wa Keeney.....	86	32	55.1	0.80
Hampton.....	77	24	47.0	2.89	Wallace (1).....	84	30	54.0	0.06
Hopkinton.....	81	28	50.5	2.14	Wallace (2).....	84	30	54.0	0.06
Hopkinton.....	82	30	48.0	2.55	Weskan (1).....	79	30	49.9	0.06
Independence.....	83	30	49.0	2.78	Winona.....	85	33	56.8	0.06
Iowa City.....	88	27	50.4	1.63	Yates Centre.....	94	24	56.8	0.66
Keosauqua.....	90	30	54.5	3.38	<i>Kentucky.</i>				
Larrabee.....	76	21	45.4	1.16	Bowling Green.....	88	34	58.7	0.96
Le Claire.....	80	26	54.0	5.64	Burkesville.....	88	34	58.7	0.10
Logan.....	75	20	46.9	3.05	Burnside.....	84	28	48.2	1.27
Mason City.....	83	34	49.0	1.62	Caddo.....	84	28	48.2	1.60
Maxon.....	83	34	49.0	1.62	Caldwell.....	84	28	48.2	1.60
Maquoketa.....	88	28	49.2	1.90	Canton.....	90	30	56.2	0.60
Marshalltown.....	81	24	49.5	2.89	Earlington.....	91	33	59.3	0.90
McCalsland.....	84	28	49.5	0.85	Elmington.....	83	27	53.8	0.24
Monticello.....	87	23	48.2	2.16	Falmouth (1).....	87	26	52.6	1.78
Moor.....	92	25	52.2	1.75	Fort Thomas.....	87	26	52.6	1.44
Mount Pleasant (1).....	87	25	49.6	1.63	Frankfort (1).....	92	31	58.1	1.07
Mount Pleasant (2).....	87	25	49.6	1.68	Franklin.....	92	31	58.1	1.07
Murray.....	79	27	50.6	2.01	Greensburg.....	89	31	53.0	1.30
Muscataine (2).....	88	28	51.6	1.49	Harrodsburg.....	89	31	53.0	1.60
Osage.....	83	23	44.1	3.09	Louisville.....	85	23	51.3	2.51
Oskaloosa (1).....	85	25	51.8	2.03	Middleborough.....	85	23	51.3	1.42
Panama.....	80	26	46.3	6.53	Newport Barracks.....	89	25	52.8	1.18
Richland.....	88	28	49.0	1.65	Paducah.....	89	25	52.8	1.18
Sac City.....	82	24	48.8	5.85	Paducah.....	89	25	52.8	1.18
Sanborn.....	80	28	48.4	0.91	Pellville.....	88	24	55.0	0.16
Stilson.....	79	20	48.4	3.41	Princeton.....	91A	23A	56.0A	0.27
Storm Lake.....	76	28	48.4	4.36	Richmond.....	82	37	56.4	0.30
Tipton.....	88	28	50.6	1.38	Shelbyville.....	89	22	53.4	1.35
Vinton.....	77	27	49.0	2.99	South Fork.....	89	22	53.4	1.35
Washington.....	90	30	53.5	1.19	Williamsburg.....	89	22	53.4	1.35
Webster City.....	78	23	47.7	3.02	<i>Louisiana.</i>				
Williams.....	76	20	43.9	2.68	Alexandria.....	83	31	63.0	0.80
Windsor.....	78	23	47.7	1.68	Amite City.....	88	32	61.7	0.06
Winterset.....	78	30	51.8	2.18	Baton Rouge.....	94	34	62.4	2.36
<i>Kansas.</i>					Cameron.....	96	38	66.2	1.59
Abilene.....	88	25	56.4	3.34	Cheneyville.....	90	34	63.2	0.03
Allison.....	90	26	55.6	0.42	Coushatta (1).....	90	30	62.8	0.50
Altoona.....	88	27	56.2	1.54	Coushatta (2).....	90	30	62.8	0.50
Atchison.....	88	27	56.2	1.54	Delhi.....	86	30	64.4	0.23
Bucklin.....	80	31	51.0	1.00	Emille.....	86	30	64.4	0.23
Cawker City.....	80	27	53.0	5.10	Grand Coteau.....	88	41	63.4	1.38
Collier.....	88	32	53.0	0.70	Homer.....	85	35	63.3	0.00
Columbus.....	90	27	61.7	1.47	Honaker.....	80	38	64.8	0.24
Concordia.....	85	28	53.0	6.14	Jackson Barracks.....	80	38	64.4	3.07
Cunningham.....	85	28	53.2	3.60	La Fayette.....	91	35	65.4	0.53
Downs.....	85	28	53.2	6.12	Liberty Hill.....	94	33	63.6	0.00
Dwight.....	85	28	53.2	6.12	Luling.....	88	35	63.7	0.58
Elco.....	90	29	56.7	1.52	Marksville.....	90	36	63.3	T.
Ellis.....	84	32	56.2	1.30	Minden.....	90	33	63.2	T.
Emporia.....	86	30	56.2	1.30	Monroe.....	90	35	62.6	0.75
Englewood.....	84	34	55.3	4.19	Natchitoches.....	85	32	59.4	0.00
Eureka Ranch.....	84	26	53.4	1.59	Sugar Ex. Station.....	90	51	67.3	1.35
Ft. Leavenworth (1).....	80	26	55.8	1.38	<i>Maine.</i>				
Ft. Leavenworth (2).....	80	30	55.2	1.27	Bar Harbor.....	74	25	47.6	4.76
					Beaufort.....	72	29	45.9	2.97

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
Maine—Cont'd.					Michigan.				
Calais	77	22	46.2	5.78	Adrian	86	20	48.8	2.27
Cornish	82	21	46.1	4.58	Albion (1)	80	25	49.9	1.02
East Machias †	66	22	44.1	6.45	Allegan	88	24	51.2	1.20
Fairfield	82	19	44.3	1.38	Alma	87	19	47.5	0.66
Farmington	90	13	45.3	1.68	Ann Arbor	80	28	48.5	1.88
Fort Preble	80	24	49.1	3.25	Arbela	69	27	40.4	1.30
Kennebec Arsenal.	84	19	43.4	1.76	Atlantic	69	27	40.4	1.95
Kents Hill	83	21	44.6	2.12	Bell Mountain	79	25	47.4	1.95
Lewiston	83	23	46.0	2.40	Bear Lake	81	27	48.1	2.56
Mayfield	80	14	41.6	1.56	Bellaire	87	25	47.1	2.77
Orono †	83	22	45.4	2.85	Bell Branch	68	30	44.6	1.00
Petit Menan	58	28	43.7	.....	Benton Harbor	87	34	54.0	1.00
West Jonesport	64	24	45.2	.....	Benzonia	81	27	47.8	3.78
Maryland.					Berlin	86	24	48.8	2.33
Barren Creek Sp'gs †	84	30	55.4	4.83	Berrien Springs (2).	86	18	48.4	0.45
Cumberland (1) †	80	30	51.5	2.21	Birch Run	81	25	49.0	1.61
Cumberland (2) †	85	33	56.1	2.39	Birmingham	81	25	49.0	1.61
Darlington	83	28	50.5	.....	Bronson	70	26	43.8	1.16
Fallston	85	31	52.0	0.06	Calumet	74	29	43.2	3.78
Fort McHenry	82	35	54.4	2.56	Caldwell	84	24	47.0	2.26
Frederick	85	32	54.7	1.79	Charlevoix	86	32	49.1	4.28
Jewell	74	38	54.6	4.00	Cheboygan	85	20	45.1	2.51
McDonough	80	27	51.7	2.20	Clinton	86	26	47.4	1.25
Mt. St. Mary's Col.	86	29	52.3	2.68	Colon	82	30	47.5	0.76
New Market	80	31	50.9	2.12	Concord	80	23	48.3	1.08
Taneytown †	80	31	50.9	2.12	Crystal Falls	71	9	43.6	0.90
Woodstock	79	29	51.3	2.90	Deerfield	83	25	49.0	2.44
Massachusetts.					East Tawas	80	26	48.5	0.61
Adams	82	27	49.7	.....	Eden	82	25	50.6	0.84
Amherst	81	22	48.6	2.81	Evart	75	18	46.9	1.64
Amherst Ex Sta (1).	87	21	47.6	2.56	Fairview	81	25	50.9	1.43
Amherst Ex Sta (2).	89	20	49.9	2.94	Fitchburg	81	19	47.7	2.06
Andover	88	22	47.8	3.35	Flint	84	18	47.4	1.06
Ashland	80	22	47.8	3.96	Fort Brady	77	23	44.5	2.62
Blue Hill (sum't.).	81	23	48.8	5.90	Fort Mackinac.	77	29	44.5	2.51
Blue Hill (base)	81	23	50.0	6.23	Fort Wayne	86	20	49.5	1.65
Blue Hill (valley).	84	19	49.0	6.06	Fremont	85	23	47.6	1.04
Boston	80	25	48.8	5.50	Gaylord	86	17	41.8	0.50
Cambridge (1)	78	25	48.8	4.82	Grape	88	26	51.3	2.00
Cambridge (2)	80	25	49.6	5.10	Grayling	85	18	45.6	1.79
Chestnut Hill	86	24	51.0	5.70	Hanover	80	30	50.2	1.96
Chicopee	80	25	48.8	3.73	Harbor Springs	84	22	48.3	2.45
Clinton	80	25	48.8	2.85	Harrisville	82	23	46.8	1.04
Concord †	87	18	48.0	3.16	Hart	80	35	51.4	3.35
Cotuit	70	26	50.2	10.14	Hastings	82	21	48.4	1.07
Deerfield	85	20	48.0	.....	Hayes	80	26	46.8	2.17
Dudley	84	23	48.6	2.96	Highland Station	84	25	48.1	1.22
Egg Rock, Nahant.	70	24	49.9	.....	Hillsdale	80	30	49.2	1.44
Fall River (1) *	82	26	50.3	5.63	Holt	85	18	48.4	1.28
Fiskdale	82	22	47.4	3.73	Howell	77	15	45.9	1.75
Fitchburg (1)	82	22	47.4	3.73	Hudson	87	23	46.0	2.23
Fitchburg (2)	86	22	48.7	3.37	Ivan	72	22	45.9	2.52
Florida (1) †	83	18	43.7	3.45	Jackson	81	25	47.9	2.52
Florida (2).	80	21	49.1	3.11	Jeddo	85	30	51.9	0.97
Fort Warren	77	29	51.3	3.22	Kalamazoo	85	30	51.9	0.97
Framingham	84	26	48.6	3.70	Lathrop	74	20	44.0	2.38
Gilbertville	83	19	46.3	3.82	Madison	82	24	48.8	1.65
Groton (1).	83	21	49.6	2.72	Marshall	85	23	48.4	1.12
Heath	82	26	47.9	.....	May	84	25	48.9	1.85
Hoosac Tunnel.	83	29	49.7	2.10	Montague	79	27	47.6	1.28
Kendall Green.	80	22	50.0	4.18	Mottville	89	23	50.5	0.72
Lake Cochituate.	89	16	49.8	4.14	Noble	72	32	45.9	1.98
Lawrence	88	23	49.6	2.96	North Marshall.	85	20	47.5	1.20
Leicester	78	23	49.1	1.87	Olivet.	81	22	47.8	0.40
Leominster	80	25	49.1	3.41	Otsego	80	23	49.9	1.22
Long Plain.	76	24	51.2	8.73	Ovid.	82	22	47.8	0.69
Lowell (1).	87	22	49.5	2.92	Parkville	87	24	50.4	1.10
Lowell (2).	86	20	48.4	.....	Paw Paw	76	30	49.4	1.69
Lowell (3).	90	20	49.3	.....	Pontiac	82	30	48.1	1.60
Ludlow (1).	86	17	46.6	3.73	Pulaski	87	26	49.8	2.40
Lynn.	88	22	47.0	5.95	Rawsonville	87	26	49.8	2.40
Mansfield	81	21	49.4	5.84	Rockland	74	28	42.9	2.51
Medford	80	22	49.0	3.40	Saint Ignace.	82	24	44.7	2.24
Middleborough	83	19	49.4	5.70	Saint John.	85	25	49.5	0.75
Milton *	77	25	49.0	6.30	Sand Beach	68	26	45.6	2.08
Monson	83	20	48.6	4.18	Thornville	84	28	49.7	3.26
Mount Nonotuck	.....	.....	.....	2.69	Vandalia	82	28	50.6	1.73
Mystic Lake	.....	.....	.....	4.94	Vienna	.....	.....	.....	1.92
Mystic Station	.....	.....	.....	5.05	Washington.	85	23	46.9	1.94
Nahant.	76	28	50.2	.....	Weldon Creek	86	26	48.1	2.54
New Bedford (1).	73	24	49.1	7.02	White Pigeon	86	22	48.6	0.51
New Bedford (2).	75	24	50.2	6.41	Williamston.	84	30	50.4	0.35
Newburyport (1).	82	23	49.2	4.32	Ypsilanti	78	20	44.5	1.96
Newburyport (2).	82	23	49.2	4.32	Minnesota.				
Northampton	81	28	50.4	2.76	Alexandria	.....	.....	.....	0.78
North Billerica	84	20	49.2	2.35	Alma City	74	22	46.2	2.14
Plymouth	75	30	51.8	5.72	Crookston †	75	23	42.3	2.81
Princeton	84	21	47.8	3.31	Farmington *	72	28	48.0	1.50
Provincetown.	74	33	51.8	5.82	Fergus Falls	.....	.....	.....	1.01
Randolph	.....	.....	.....	5.60	Fort Ripley †	71	22	46.0	0.94
Roberts Dam	.....	.....	.....	3.86	Fort Snelling	71	22	46.0	0.88
Royalston *	76	28	48.8	2.50	Grand Meadow	76	20	44.8	4.13
Salem (2).	80	22	41.8	5.45	Kinbrae.	79	17	46.6	1.70
Savoy	80	22	41.8	2.00	L. Winnibigoshish *	70	25	42.9	1.25
Somerset †	85	24	52.6	4.37	Leech Lake *	72	19	42.7	0.84
South Hingham	80	26	49.8	6.22	Le Sueur *	71	22	47.0	2.07
Springfield Arm'y	85	26	49.8	3.39	Mankato	74	27	47.6	1.14
Taunton (3).	85	19	49.6	5.15	Minneapolis *	72	26	46.7	1.84
Taunton (4).	91	23	50.8	5.80	Montevideo †	81	24	49.2	0.93
Wakefield	84	20	49.5	4.66	Morris	78	24	45.4	1.03
Waltham	.....	.....	.....	4.34	Northfield †	76	24	46.9	2.54
Westborough	87	18	51.3	2.95	Ortonville †	71	21	43.6	0.89
Williamstown	78	22	45.9	1.80	Pine River *	71	21	43.6	0.64
Winchester	.....	.....	.....	4.53	Red Wing.	77	26	48.7	2.14
					Redwood Falls	.....	.....	.....	1.10

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
<i>Minnesota—Cont'd.</i>					<i>Nebraska—Cont'd.</i>				
Saint Charles*†.....	77	21	43.0	4.09	Ansley†.....	88	18	49.4	1.14
<i>Mississippi.</i>					Ashland*.....	83	27	55.0	5.86
Aberdeen.....	86	28	57.2	0.00	Auburn(1)*†.....	86	26	57.0	2.44
Agricultural Col'ge.....	88	39	63.1	T.	Bassett.....	89	20	50.5	0.27
Batesville†.....	91	30	59.8	0.78	Beatrice†.....	79	29	50.5	6.17
Bay Saint Louis†.....	80	50	65.9	2.50	Beaver City*.....	98	28	55.6	1.08
Brookhaven†.....	93	30	62.8	0.99	Burwell*.....	84	22	47.8	0.71
Canton†.....	89	34	61.2	1.28	Creighton†.....	77	22	45.3	0.65
Columbus(1)†.....	95	32	61.2	0.07	Crete.....	84	28	50.6	5.56
Columbus(2)†.....	95	32	61.2	0.00	Culbertson(1)†.....	78	29	45.7	5.05
Corinth†.....	86	30	59.7	1.95	David City*†.....	83	24	49.8	5.10
Edward†.....	91	36	62.0	0.25	De Soto.....	72	28	53.5	2.10
Enterprise†.....	91	29	58.2	0.08	Dunning*.....	78	29	49.0	1.28
Fayette†.....	91	42	64.2	1.88	Ericson*†.....	86	25	48.5	1.10
Greenville.....	86	40	61.8	0.86	Ewing*.....	80	28	50.0	6.10
Hattiesburg†.....	95	35	65.1	0.00	Fairbury.....	84	17	48.0	1.20
Hazlehurst†.....	92	32	61.1	0.32	Fort Niobrara.....	82	27	52.8	6.40
Hernando†.....	91	31	61.9	0.40	Fort Omaha.....	79	18	48.8	0.45
Holly Springs(1).....	86	40	59.8	1.40	Fort Robinson.....	82	20	53.8	1.30
Holly Springs(2)†.....	84	36	59.7	1.44	Fort Sidney.....	82	27	51.2	2.22
Jackson†.....	89	30	61.4	0.04	Franklin*.....	80	29	50.8	4.74
Kosciusko†.....	91	31	60.6	0.00	Fre蒙特*.....	80	29	49.6	3.48
Lake†.....	92	28	58.8	0.00	Geneva.....	80	24	51.6	0.13
Logtown†.....	86	39	64.0	3.40	Genoa†.....	90	29	54.1	0.35
Louisville†.....	99	27	62.0	0.22	Gering†.....	80	29	49.6	2.51
Macon†.....	96	38	63.6	0.05	Grand Island.....	83	22	49.1	1.15
Natchez.....	94	39	63.8	2.08	Grant†.....	80	29	48.8	4.69
Okolona†.....	90	30	60.7	0.01	Hartington†.....	78	32	49.8	3.75
Port Gibson†.....	93	28	60.7	1.86	Harvard*.....	76	20	45.8	0.75
Rienzi.....	86	38	60.8	1.71	Hastings†.....	80	29	46.8	1.70
Ship Island†.....	85	50	68.8	0.62	Hay Springs†.....	90	28	51.9	0.75
Summit†.....	89	35	64.0	1.02	Holdrege.....	90	23	47.3	1.39
Valdent.....	96	26	57.1	0.54	Imperial.....	78	17	41.4	0.09
Washington*.....	92	38	61.9	1.81	Kennedy*.....	80	26	54.0	0.80
Water Valley*.....	90	30	58.9	1.25	Kimball†.....	82	29	51.6	4.48
Waynesboro*(1)†.....	90	30	60.2	0.00	Lexington*†.....	80	28	50.8	0.25
Waynesboro*(2)†‡.....	92	-32	62.4	0.15	Lincoln.....	84	28	48.8	2.95
Yazoo City†.....	92	31	60.2	1.97	Long Pine.....	83	25	51.2	4.09
<i>Missouri.</i>					Marquette*.....	80	28	48.8	2.95
Adrian†.....	92	19	50.8	1.40	Minden.....	83	25	51.2	4.09
Appleton City†.....	90	31	55.8	1.98	Nebraska City*.....	78	25	49.8	1.79
Austin†.....	92	36	57.3	0.75	Norfolk†.....	82	21	51.0	1.09
Boonville†.....	90	30	57.0	1.90	North Loup†.....	83	28	49.9	1.24
Brunswick.....	88	31	55.6	1.50	O'Neill.....	81	30	52.2	1.24
Cape Girardeau†.....	88	33	54.2	1.52	Plattsmouth†.....	80	34	54.6	4.00
Carrollton†.....	88	32	56.4	1.52	Precept*.....	85	23	50.5	1.03
Carthage*†.....	88	33	56.4	1.52	Purple Cane*.....	80	34	54.6	4.00
Centreville.....	88	33	56.4	1.52	Ravenna.....	85	23	50.5	1.03
Chillicothe(1).....	84	52	66.2	0.83	Sargent.....	80	24	49.2	0.28
Chillicothe(2).....	86	32	59.6	1.20	Schuyler†.....	81	22	51.6	0.56
Conception.....	82	14	53.0	0.90	Springview.....	90	24	54.6	0.60
Concordia.....	92	26	53.0	0.85	Starkville.....	92	35	56.1	0.75
Dadeville†.....	90	26	53.0	1.05	Superior*.....	82	30	52.0	4.64
Dunnean.....	91	30	54.8	0.76	Syracuse*.....	80	28	48.6	0.66
East Lynn*.....	89	32	54.8	1.09	Wallace*.....	84	25	48.6	5.74
Eight Mile*.....	89	32	54.8	1.09	Weeping Water*.....	79	30	49.0	2.60
Excelsior Springs*.....	85	14	48.9	0.91	West Hills.....	82	24	56.0	2.32
Fayette.....	92	26	57.1	1.28	Whitman*.....	80	22	48.6	2.49
Fox Creek*.....	90	32	54.2	0.95	Wilcox(1).....	78	24	56.0	1.00
Glasgow.....	91	28	54.9	1.18	Wilcox(2).....	80	22	48.6	2.49
Gordonville*†.....	88	27	56.6	0.65	York.....	80	22	48.6	2.49
Harris*†.....	86	27	53.0	0.84	<i>Nevada.</i>				
Harrisonville†.....	86	28	48.6	0.48	Austin.....	68	18	50.0	0.34
Hermann*†.....	85	32	55.7	1.23	Battle Mountain*.....	76	25	53.0	0.10
Jefferson Barracks.....	91	25	57.0	1.02	Belmont.....	70	20	51.0	0.70
Jefferson City†.....	88	32	54.6	1.03	Beowawe.....	80	18	55.4	0.06
Jerome†.....	90	27	55.2	0.94	Browns*.....	80	33	58.0	0.00
Kansas City.....	90	27	55.2	0.73	Candelaria.....	70	27	53.6	0.00
Lamonte(2)†.....	84	34	58.7	1.05	Carlin*.....	72	12	41.1	0.20
Lebanon.....	89	26	54.0	0.75	Carson City.....	80	19	50.3	0.00
Liberty.....	89	26	54.0	0.75	Cranes Ranch.....	79	22	55.4	T.
Louisiana Bridge†.....	89	26	52.8	1.44	Downeyville.....	76	18	55.1	0.00
Marble Hill.....	89	26	55.8	1.07	Elko(1).....	81	0	40.2	0.00
Mine La Motte.....	88	28	53.6	0.30	Elko(near).....	67	12	38.8	0.10
New Haven*.....	88	28	53.6	0.30	Ely.....	84	17	53.3	0.20
Oak Ridge*.....	85	24	58.2	0.40	Eureka.....	76	25	50.4	1.25
Oregon(1).....	84	26	54.5	1.54	Fenelon*.....	74	22	52.2	T.
Oregon(2).....	85	31	54.2	1.53	Genoa.....	80	26	51.4	0.05
Pickering.....	88	24	53.6	1.76	Goldsboro*.....	88	12	44.9	T.
Platte River*.....	86	32	55.1	0.87	Halleck.....	76	30	55.7	T.
Princeton*.....	86	32	55.1	0.87	Hawthorne(1)*.....	72	30	49.5	0.00
Rolla.....	89	32	56.4	0.83	Hawthorne(2).....	78	28	53.9	0.00
Saint Charles(2).....	89	32	56.4	0.83	Hot Springs*.....	78	28	53.9	0.00
Saint Joseph.....	89	26	54.7	0.94	Humboldt.....	78	28	53.9	0.00
Saint Louis.....	91	26	56.8	0.74	Lewers Ranch.....	78	24	55.1	0.07
Sarcozie.....	92	32	55.1	1.19	Mill City.....	74	12	44.0	T.
Sedalia.....	92	32	55.1	1.19	Monitors Ranch.....	74	12	44.0	T.
Shelbina.....	90	28	57.5	1.35	Palisade*.....	80	20	50.8	0.06
Stellada.....	92	34	56.2	0.99	Palmetto.....	78	12	53.4	0.01
Warrensburg*.....	90	34	56.2	0.99	Pioche.....	80	22	54.0	T.
Warrenton.....	90	34	56.2	0.99	Reno*.....	78	28	51.1	0.00
Withers Mills.....	90	34	56.2	0.99	Reno State Univ'asy.....	77	24	51.6	T.
Zeitonia.....	90	34	56.2	0.99	Stofel.....	71	0	34.9	0.09
<i>Montana.</i>					Tecoma*.....	70	25	45.5	0.09
Boulder Valley†.....	73	4	42.8	0.07	Toano.....	78	20	49.0	0.09
Camp Poplar River.....	75	10	46.7	2.01	Virginia City.....	74	25	54.2	T.
Choteauf.....	80	16	47.2	0.76	Wadsworth.....	82	24	54.5	0.00
Fort Custer.....	82	18	55.0	4.60	Wells*.....	78	22	51.8	0.00
Fort Keogh.....	87	22	45.4	1.58	Winnemucca*.....	80	15	48.4	0.03
Fort Missoula.....	76	16	45.8	0.90	Younts Ranch.....	80	36	63.4	0.00
Glendive†.....	78	20	47.4	2.83	<i>New Hampshire.</i>				
Virginia City†.....	70	17	45.2	0.39	Antrim.....	73	23	47.3	2.73
<i>Nebraska.</i>					Belmont.....	83	10	42.1	1.89
Alliance†.....	80	18	47.0	0.15	Berlin Mills.....	83	10	42.1	1.89

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
<i>N. Hampshire—Con.</i>				<i>Ins.</i>	<i>New York—Cont'd.</i>				<i>Ins.</i>
Concord (1).....	83	22	47.2	2.63	Bethlehem Centre.....	84	23	48.0	2.19
Concord (2).....	84	18	45.8	3.07	Binghamton.....	84	23	48.0	4.34
East Canterbury.....	76	19	45.8	2.75	Bloods Depot.....	84	23	48.0	2.61
Groveton.....	82	20	43.0	1.35	Bolivar.....	84	23	48.0	2.65
Hanover (1).....	79	15	46.4	1.50	Brentwood.....	82	28	52.2	7.55
Hanover (2).....	79	14	45.2	1.49	Brookport.....	85	22	50.9	1.90
Lake Village.....	80	15	42.4	1.73	Brookfield.....	83	16	44.4	3.70
Littleton.....	80	15	42.4	1.73	Canton.....	83	20	45.6	3.12
Manchester.....	87	19	48.9	3.08	Central Park, N. Y.....	86	35	54.7	2.60
Mine Falls.....	88	19	48.7	2.50	Cherry Creek.....	80	18	43.1	3.12
Nashua.....	88	19	48.7	2.50	Constableville.....	80	18	43.1	3.12
Newton.....	83	18	47.6	3.55	Cooperstown.....	78	22	45.1	3.01
North Conway.....	86	16	45.2	3.44	Davids Island.....	83	28	52.7	0.28
Pennichuck Station.....	83	16	42.0	1.66	De Kalb Junction.....	83	28	52.7	0.28
Plymouth.....	83	16	42.0	1.66	Demeter.....	83	28	52.7	0.28
Stratford.....	80	14	46.5	0.92	Deposit.....	83	28	52.7	0.28
Walpole.....	80	17	44.8	2.24	Dunkirk (1).....	83	28	52.7	0.28
West Milan.....	82	11	42.6	1.64	Dunkirk (2).....	83	28	52.7	0.28
Wiers Bridge.....	82	11	42.6	1.64	Eden Centre.....	82	22	47.9	2.12
Wolfborough.....	82	11	42.6	1.64	Factoryville.....	87	18	46.7	4.34
<i>New Jersey.</i>					Fleming.....	88	27	48.9	4.36
Allaire.....	84	21	51.2	.....	Fort Columbus.....	83	33	55.0	2.87
Asbury Park.....	80	27	53.5	5.31	Fort Hamilton.....	85	32	53.9	3.56
Bayonne.....	90	27	53.9	2.57	Fort Niagara.....	85	30	52.6	1.38
Belleville.....	83	23	51.4	4.18	Fort Porter.....	80	28	48.9	1.50
Belvidere.....	83	23	51.4	4.18	Fort Schuyler.....	84	26	53.2	3.47
Beverly.....	88	24	51.6	2.69	Fort Wadsworth.....	88	25	53.9	3.45
Blairtown.....	85	18	49.8	2.75	Geneva.....	89	25	49.3	3.95
Bridgeton (1).....	83	30	55.2	3.63	Hammondsport.....	83	23	47.2	2.75
Bridgeton (2).....	87	29	56.6	3.18	Hess Road Station.....	84	24	48.2	1.65
Camden.....	84	26	54.4	3.18	Honeybrook Brook.....	82	29	47.7	1.70
Cape May C. H. f.....	83	31	55.7	5.57	Humphrey.....	83	22	47.5	2.43
Deckertown.....	83	25	49.8	1.96	Italy Hill.....	79	24	44.4	2.40
Dover.....	86	23	50.7	2.23	Ithaca.....	84	26	49.8	5.25
Egg Harbor City.....	86	26	51.7	4.89	Jamestown.....	76	24	47.3	.....
Elizabeth.....	83	21	51.8	3.80	Kings Station.....	82	24	45.3	1.44
Franklinville.....	82	21	51.8	3.80	Le Roy.....	82	24	45.3	1.44
Freehold.....	82	30	51.3	3.32	Liberty.....	82	24	45.3	1.44
Gillette.....	87	23	50.5	3.26	Little Valley.....	83	25	49.2	1.57
Hanover.....	80	20	47.8	2.35	Lockport.....	83	25	49.2	1.57
Highland Park.....	88	25	53.3	3.05	Lowville.....	85	28	49.0	3.58
Hightstown.....	80	28	51.7	3.72	Lyndsville.....	85	28	49.0	3.58
Imlaytown.....	84	27	52.8	3.66	Lyon.....	77	25	46.4	.....
Junction.....	83	28	52.3	3.81	Lyon Mountain (1).....	82	25	46.4	.....
Lambertville.....	85	24	52.2	4.76	Lyon Mountain (2).....	82	25	46.4	.....
Locktown.....	85	24	52.2	4.76	McLean.....	87	30	48.9	3.43
Moorestown.....	89	29	52.7	2.80	Madison Barracks.....	87	30	48.9	3.43
Mount Holly.....	83	29	53.6	3.64	Malone.....	82	19	44.0	3.50
Newark (1).....	82	30	53.4	2.54	Middletown.....	81	30	49.3	1.93
New Brunswick (1).....	92	25	54.4	3.29	Minnewaska.....	75	26	46.5	1.90
New Brunswick (2).....	84	26	52.5	3.16	Mount Morris.....	84	22	47.3	1.83
Newton.....	80	29	50.6	1.88	Newark Valley.....	82	17	43.1	3.26
Oceanic.....	83	31	55.2	5.03	New Lisbon.....	84	28	45.6	3.08
Paterson.....	88	25	54.3	2.14	North Hammond.....	77	16	42.3	3.52
Ranocosa.....	85	31	52.7	2.74	Number Four.....	77	16	42.3	3.52
Readington.....	88	26	52.7	2.74	Oxford.....	77	16	42.3	3.52
Salem.....	84	27	53.4	3.48	Palermo.....	83	20	46.8	3.51
Somerville.....	89	20	53.6	2.95	Pawling.....	83	20	46.8	3.51
South Orange.....	83	26	50.7	2.95	Peekskill.....	85	22	46.0	5.40
Tenafly.....	88	23	52.8	2.40	Perry City.....	85	22	46.0	5.40
Trenton.....	83	30	52.3	3.83	Plattsburgh.....	85	25	45.9	2.00
Wineland.....	85	26	53.0	3.23	Plattsburgh B'ks.....	87	17	45.3	2.07
Whiting.....	87	27	54.2	4.11	Port Jervis.....	86	25	49.0	2.05
<i>New Mexico.</i>					Poughkeepsie.....	86	18	49.0	1.79
Albert.....	79	28	59.6	0.16	Quaker Street.....	85	20	46.2	3.44
Antelope Springs.....	76	24	48.5	0.00	Rome.....	84	21	47.2	3.34
Bernalillo.....	76	24	48.5	0.00	Romulus.....	88	27	49.3	4.07
Bloomfield.....	78	24	53.0	0.00	Saratoga.....	80	25	48.8	.....
Chama.....	79	22	49.9	0.75	Setauket.....	82	31	52.9	6.60
Coolidge.....	82	13	44.6	0.64	Sherman.....	80	27	46.2	1.52
Deming.....	80	49	64.9	0.00	South Canisteo.....	84	21	44.6	3.48
Dulce.....	73	14	42.5	0.17	South Kortright.....	82	14	44.2	.....
Embudo.....	73	14	42.5	0.17	Syracuse.....	82	30	47.6	3.06
Estalina Springs.....	72	25	49.8	0.49	Turin.....	80	20	42.4	3.66
Folsom.....	76	28	54.8	0.49	Utica.....	86	24	48.5	3.64
Port Bayard.....	80	34	58.0	0.07	Victor.....	84	25	48.6	3.58
Port Stanton.....	77	19	50.1	0.00	Wappingers Falls.....	83	22	49.3	2.40
Port Wingate.....	79	24	52.7	0.00	Watervleit Arsenal.....	89	24	47.4	3.41
Gallinas Spring.....	80	34	56.0	0.33	Wedgwood.....	91	21	46.5	4.19
Hillsborough.....	81	30	58.3	0.00	West Chazy.....	84	29	48.4	0.93
La Lusa.....	79	25	54.9	0.00	White Plains.....	80	26	52.4	2.10
Lordsburg.....	80	42	61.0	0.00	Willels Point.....	84	28	53.0	3.77
Los Lunas.....	76	22	47.8	0.00	<i>North Carolina.</i>				
Monero.....	68	16	43.9	0.51	Asheville.....	84	29	51.8	0.78
Olof.....	72	28	51.7	0.00	Bakersville.....	80	22	50.6	2.20
Pojuaque.....	72	28	51.7	0.00	Bryson City.....	87	32	58.0	3.43
Red Cañon.....	88	30	57.0	0.00	Chapel Hill.....	92	26	56.4	1.58
Socorro.....	86	35	57.0	0.00	Concord.....	88	26	56.8	1.20
Springer.....	86	35	57.0	0.00	Currituck Inlet.....	87	32	58.0	7.76
Taos.....	86	35	57.0	0.00	Fayetteville.....	87	32	58.0	7.76
Wallace.....	78	28	54.5	0.00	Goldborough.....	87	32	58.0	7.76
<i>New York.</i>					Hendersonville.....	76	31	51.7	0.10
Adams Centre.....	84	22	46.5	2.94	Lenoir.....	81	29	52.6	0.80
Addison.....	84	22	46.5	2.94	Lillington.....	81	29	52.6	0.80
Afton.....	84	22	46.5	2.94	Linville.....	73	24	46.1	1.10
Akron.....	84	22	46.5	2.94	Littleton.....	90	26	54.7	2.89
Albion.....	84	22	46.5	2.94	Louisburgh.....	80	30	54.7	2.07
Alfred Centre.....	82	22	45.8	2.61	Lumberton.....	89	29	58.8	1.16
Angelica.....	82	17	44.0	2.61	Madison.....	85	28	53.7	0.56
Arcade (1).....	80	30	44.5	2.16	Morgantown.....	80	28	53.7	0.56
Arkwright.....	76	29	47.4	.....	Mount Airy.....	83	23	52.6	1.04
Au Sable Forks.....	76	29	47.4	.....	Mount Holly.....	83	23	52.6	1.04
Avon.....	76	29	47.4	.....				
Baldwinsville.....	86	24	49.2	3.77					
Bedford.....	86	24	49.2	3.77					

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
<i>N. Carolina—Cont'd.</i>	°	°	°	<i>Ins.</i>	<i>Oregon.</i>	°	°	°	<i>Ins.</i>
Mount Pleasant.....	87	25	54.3	0.62	Albany.....	82	36	54.0	5.41
Murphy.....	86	28	59.8	3.87	Arlington.....	82	33	55.4	1.44
New Bern.....	86	28	59.8	3.87	Ashland (1).....	75	28	53.8	0.41
Oak Ridge.....	85	28	54.7	1.35	Ashland (2).....	84	27	53.7	0.81
Pittsborough.....	86	28	54.8	1.50	Bandon.....	66	42	54.4	5.78
Salisbury.....	82	36	58.0	1.14	Beulah.....	80	14	46.6	0.13
Saxton.....	85	24	54.0	1.14	Burns.....	78	11	46.3	.....
Smithfield.....	87	29	56.1	3.45	Cascade Locks.....	76	43	57.5	8.31
Soapstone Mount.....	87	29	56.1	3.45	Corvallis.....	81	31	54.4	4.10
Southern Pine.....	90	25	56.8	2.11	East Portland.....	81	41	.....	5.18
Wadesborough.....	84	32	56.0	0.76	Eola.....	86	36	54.2	5.19
Wadeville.....	88	29	56.0	1.21	Eugene.....	81	35	56.2	3.35
Weldon.....	88	30	55.0	6.10	Forest Grove.....	84	32	54.2	4.44
Wilmington.....	88	27	56.2	5.70	Gardiner.....	73	42	56.2	6.28
<i>North Dakota.</i>					Grants Pass.....	80	28	55.4	1.96
Bathgate.....	70	20	43.4	1.72	Grass Valley.....	70	38	49.2	0.35
Carrington.....	70	20	43.4	1.72	Hardman.....	80	30	47.0	0.36
Ellendale.....	76	26	47.4	1.29	Heppner.....	83	22	52.6	0.33
Fargo.....	79	22	45.3	1.32	Hood River (near).....	76	36	53.6	2.45
Fort Buford.....	73	15	41.4	1.80	Hubbard.....	85	32	54.2	.....
Fort Pembina.....	75	18	41.7	1.93	Jacksonville.....	80	32	54.0	1.02
Fort Yates.....	78	26	48.0	1.25	John Day Junction.....	81	29	55.8	0.16
Gallatin.....	74	24	48.0	1.25	Joseph.....	76	22	47.2	0.63
Grafton.....	71	16	42.4	2.44	La Grande.....	80	25	52.5	1.05
Grand Rapids.....	77	16	43.5	1.70	Lakeview.....	89	19	53.1	0.42
Hope.....	71	24	43.8	2.27	Langlois.....	71	35	54.0	7.02
Lakota.....	75	19	43.8	2.17	Lone Rock.....	80	31	51.0	0.20
Napoleon.....	72	21	43.0	2.18	McMinnville.....	83	32	54.6	5.00
Power.....	78	22	46.5	1.07	Mount Angel.....	80	36	55.7	6.61
Saint John.....	71	16	41.0	2.12	Newburg.....	85	37	56.6	5.36
Saint Thomas.....	78	18	41.9	2.34	New Bridge.....	75	30	48.2	1.18
Valley City.....	72	16	43.2	3.56	Pendleton.....	85	22	54.2	0.08
Wild Rice.....	75	16	40.7	1.26	Siskiyou.....	80	35	55.1	0.70
Willow City.....	75	16	41.7	3.03	The Dalles.....	80	33	54.3	1.14
Woodbridge.....	79	17	42.6	0.83	Vernonia.....	84	42	53.8	5.70
<i>Ohio.</i>					Weston.....	83	25	53.2	0.77
Akron.....	84	30	50.6	1.45	<i>Pennsylvania.</i>				
Ashland.....	83	36	50.0	1.73	Allegheny Arsenal.....	87	39	52.4	1.67
Bangorville.....	93	22	49.6	2.39	Altouna.....	82	34	53.5	2.54
Bellevue.....	90	18	49.0	2.50	Aqueduct.....	88	26	51.0	3.15
Caledonia.....	86	26	50.8	3.15	Blooming Grove.....	81	26	48.0	3.30
Canton.....	86	26	50.8	1.13	Blue Knob.....	80	23	45.3	3.30
Celina.....	84	29	53.0	0.90	Brookville.....	.....	.....	.....	1.39
Circleville (1).....	87	23	51.6	1.78	Browsers Lock.....	.....	.....	.....	3.08
Clarksville.....	85	30	51.6	2.01	Carlisle.....	91	26	50.6	3.51
Cleveland.....	81	23	52.0	2.79	Clarion (1).....	.....	.....	.....	2.47
Columbus Barracks.....	86	25	52.6	2.36	Confence.....	.....	.....	.....	3.31
Dayton.....	86	25	52.6	2.36	Coopersburgh.....	83	27	50.6	2.74
Demos.....	84	27	50.8	0.54	Corry.....	84	19	47.0	1.95
Ellsworth.....	.....	.....	.....	1.08	Davis Island Dam.....	.....	.....	.....	1.76
Elyria.....	89	30	53.0	1.96	Doylstown.....	.....	.....	.....	4.22
Findlay.....	88	30	50.9	2.72	Du Bois.....	.....	.....	.....	3.68
Fostoria.....	89	24	51.3	2.98	Dyberry.....	84	15	44.1	3.41
Garrettsville.....	84	20	46.8	1.55	Easton.....	81	25	50.0	3.42
Georgetown.....	86	28	53.5	2.02	Edinborough.....	80	25	49.0	.....
Granville.....	87	20	48.0	2.30	Emporium.....	85	23	48.2	3.48
Grafton.....	84	25	51.1	1.32	Esks of Nesheim.....	.....	.....	.....	3.68
Greenfield.....	81	23	48.8	1.87	Frankford Arsenal.....	89	25	54.4	2.30
Greenville.....	80	26	50.0	1.09	Frederick.....	.....	.....	.....	3.22
Hanging Rock.....	88	26	50.6	1.14	Freeport.....	.....	.....	.....	2.29
Hiram.....	85	29	49.3	1.37	Garfield.....	80	27	48.0	3.77
Hudson.....	.....	.....	.....	1.49	Grampian Hills.....	80	24	46.1	3.17
Jacksonborough.....	89	29	55.7	0.95	Greensborough.....	.....	.....	.....	2.95
Kenton.....	92	22	49.8	2.38	Hamburg.....	89	24	52.0	2.69
Logan.....	90	21	51.5	1.47	Holidaysburgh.....	87	20	49.0	2.76
Lordstown.....	85	23	48.0	1.10	Honesdale.....	78	19	47.4	3.74
Manchester.....	82	43	53.2	.....	Hulmeville.....	86	26	51.5	2.91
Mansfield.....	.....	.....	.....	2.27	Huntingdon.....	88	22	50.2	3.13
Marietta (1).....	84	28	52.7	1.97	Johnstown.....	84	27	50.9	2.86
Marietta (2).....	84	28	52.7	1.99	Kennett Square.....	.....	.....	.....	3.16
Marion.....	88	22	48.0	3.72	Kilmer.....	68	29	55.5	3.70
McConnellsville.....	86	21	50.9	1.50	Lancaster.....	86	34	52.0	3.05
Montpelier.....	81	21	50.4	0.92	Landsdale.....	.....	.....	.....	3.09
Napoleon.....	85	26	51.8	1.94	Lebanon.....	90	25	50.7	3.14
New Alexandria.....	83	28	52.3	1.06	Le Roy.....	83	25	47.4	4.25
New Comerstown.....	86	31	48.8	1.10	Lewisburgh.....	83	27	51.2	3.75
New Holland.....	85	22	50.8	2.09	Ligonier.....	87	21	50.5	0.88
North Lewisburgh.....	90	22	52.2	2.15	Lock Haven.....	89	25	50.0	2.81
Oberlin.....	89	27	50.6	1.53	Lock No. 4.....	.....	.....	.....	2.12
O. S. University.....	86	21	50.1	2.79	Mauch Chunk.....	88	.....	47.1	1.61
Orangeville.....	84	22	48.6	1.20	McConnellsburch.....	88	23	50.6	3.39
Piqua.....	89	24	51.6	1.50	New Castle.....	86	24	54.0	0.84
Pomeroy.....	86	21	52.8	1.59	Oil City.....	.....	.....	.....	1.70
Portsmouth (1).....	.....	.....	.....	1.00	Ottville.....	.....	.....	.....	3.60
Portsmouth (2).....	88	26	52.2	0.91	Parkers Landing.....	.....	.....	.....	1.64
Sidney.....	.....	.....	.....	1.69	Philadelphia (1).....	88	32	55.2	2.96
Springborough.....	86	26	50.3	2.10	Philadelphia (2).....	86	25	53.0	3.32
Tiffin.....	84	25	50.9	3.26	Phoenixville.....	.....	.....	.....	3.45
Upper Sandusky.....	86	19	50.0	1.27	Pleasant Mount.....	.....	.....	.....	4.32
Van Wert.....	87	26	50.0	2.32	Point Pleasant.....	.....	.....	.....	3.95
Wapakoneta.....	88	20	49.0	1.85	Pottstown.....	87	25	53.8	2.90
Wauseon.....	92	21	51.4	1.56	Quakertown.....	88	22	49.9	2.99
Waverly.....	80	28	56.1	2.10	Reading.....	.....	.....	.....	3.29
Waynesville.....	83	24	49.7	2.66	Ridgway.....	.....	.....	.....	3.46
West Milton.....	92	32	52.0	2.45	Salem Corners.....	86	30	50.8	2.26
Weymouth.....	90	23	52.1	1.31	Salisbury.....	.....	.....	.....	3.83
Wheeler.....	.....	.....	.....	1.48	Seisholtzville.....	.....	.....	.....	4.46
Wooster.....	88	25	48.8	1.33	Selins Grove.....	79	24	50.2	4.37
Youngstown.....	88	26	51.4	0.99	Smiths Corners.....	.....	.....	.....	2.45
Zanesville.....	.....	.....	.....	1.00	Somerset.....	88	22	47.6	3.78
<i>Oklahoma Ter.</i>					South Eaton.....	83	22	48.6	4.31
Fort Reno.....	94	33	62.2	0.30	State College.....	83	26	48.6	.....
Fort Sill.....	94	35	62.4	0.36	Stoyestown.....	.....	.....	.....	3.24
Guthrie.....	92	32	63.0	0.51					

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean.			Max.	Min.	Mean.	
Pennsylvania—Con.	0	0	0	Ins.	Tennessee—Con'd.	0	0	0	Ins.
Swarthmore.....	87	25	52.1	3.75	Hohenwald.....	92	24	53.7	1.00
Troy.....	78	20	48.5	3.31	Jacksborough.....	84	25	53.7	1.07
Uniontown.....	84	30	52.9	2.99	Johnsonville.....	87	30	56.8	0.58
Warrent.....	82	18	44.4	2.44	Kingston (1).....	87	30	56.8	0.60
Wellaborough.....	84	28	53.4	3.40	Kingston Springs.....	87	30	56.8	0.60
West Chester.....	84	28	53.4	3.40	Loudon.....	87	30	56.8	0.60
West Newton.....	84	28	53.4	3.40	Lynnville.....	87	30	56.8	0.60
Wilkes Barre.....	75	22	52.2	1.63	McKinsie.....	87	30	56.8	0.60
Wysox.....	82	20	47.2	4.43	McMinnville.....	88	30	56.8	0.60
York.....	87	20	50.1	3.20	Milan.....	88	30	56.8	0.60
Rhode Island.					Missionary Ridge.....	88	30	56.8	0.60
Bristol.....	74	27	50.6	3.68	Northville.....	82	32	53.4	1.32
Fort Adams.....	78	24	51.4	2.38	Nunnally.....	86	27	52.2	1.04
Kingston (1).....	80	22	49.8	6.12	Parkville.....	84	30	56.2	0.80
Kingston (2).....	78	20	49.5	6.22	Riddletont.....	84	30	56.2	0.80
Lonsdale.....	81	30	53.0	4.64	Rockwood.....	83	33	52.2	1.21
Olneyville.....	81	30	53.0	4.64	Rogersville.....	83	33	52.2	1.21
Pawtucket.....	81	28	51.3	4.70	Rugby.....	83	33	52.2	1.21
Providence (1).....	81	28	51.3	4.70	Savannah.....	84	31	51.4	1.50
Providence (2).....	85	23	50.8	4.87	Sharp.....	88	36	57.8	1.44
Providence (3).....	81	26	50.7	4.94	Springdale.....	84	36	57.8	1.44
South Carolina.					Strawberry Plains.....	94	30	56.6	0.95
Aiken.....	89	35	58.0	3.10	Union City.....	94	30	56.6	0.95
Allendale.....	90	32	62.4	1.85	Texas.				
Batesburg.....	88	36	61.0	0.60	Arthur City.....	88	55	72.0	0.25
Belmont.....	87	31	58.4	0.75	Austin (1).....	86	46	66.8	0.98
Blackville.....	85	30	61.4	0.85	Austin (2).....	87	40	65.6	0.30
Branchville.....	87	30	60.2	3.04	Austin (3).....	94	38	67.4	0.02
Camden.....	89	28	56.6	1.81	Big Spring.....	86	34	64.8	0.27
Cheraw (1).....	88	30	59.0	0.22	Brady.....	87	44	65.8	0.98
Cheraw (2).....	88	30	59.0	0.22	Brasoria.....	91	44	68.8	0.65
Chester.....	87	32	60.2	1.52	Brenham.....	89	38	63.7	0.09
Conway.....	87	32	60.2	1.52	Brownwood.....	82	43	64.0	0.43
Edinburgh.....	87	30	57.6	0.59	Camp Eagle Pass.....	93	34	68.3	0.00
Evergreen.....	89	32	59.9	2.55	C'p Pena Colorado.....	88	20	59.4	0.50
Florence.....	88	26	58.6	0.37	Childress.....	86	38	61.4	2.83
Greenville.....	92	32	59.4	0.42	Coldwater.....	96	44	70.3	0.00
Hardeeville.....	86	34	63.2	2.68	Columbia.....	86	41	66.0	0.40
Jacksonborough.....	86	30	60.2	2.43	Corsicana (2).....	91	36	63.8	0.05
Kingstree.....	90	28	60.3	1.35	Cuero (2).....	90	43	68.8	0.00
Kitching Mill.....	86	28	58.8	1.89	Dallas (2).....	96	40	66.2	0.00
Nichols.....	85	43	63.5	2.73	Dallas (3).....	96	30	71.3	0.00
Port Royal.....	88	32	60.7	2.60	Durham.....	89	46	69.6	0.70
Saint George.....	89	35	62.2	1.43	Duval.....	89	37	64.2	0.70
Saint Matthews.....	89	35	62.2	1.43	Fort Bliss.....	90	41	68.8	0.00
Society Hill.....	88	32	56.7	3.08	Fort Clark.....	92	36	60.0	0.00
Spartanburg (2).....	88	36	59.0	0.18	Fort Hancock.....	92	43	70.4	0.61
Statesburg.....	85	37	56.7	1.47	Fort McIntosh.....	86	36	63.7	0.99
Trial.....	90	31	61.3	2.40	Fredericksburg.....	86	36	63.7	0.99
Walhalla.....	79	33	57.4	2.40	Gainesville.....	86	36	63.7	0.99
Wateree.....	89	34	64.1	0.50	Gallinas.....	89	38	64.7	0.75
Winnabourgh.....	88	34	58.9	0.44	Harpers Ferry.....	90	32	63.1	0.10
Yorkville.....	88	34	58.9	0.44	Hinton.....	90	38	65.1	0.00
Tillers Ferry.....	88	34	58.9	0.44	Kingwood.....	82	32	50.4	1.53
South Dakota.					Martinsburg.....	82	32	50.4	1.53
Aberdeen.....	79	23	45.8	1.88	Morgantown (1).....	93	27	52.6	2.20
Britton.....	82	21	45.8	0.97	Morgantown (2).....	90	38	55.4	2.02
Brookings.....	80	20	45.4	1.07	Nutallburg.....	84	26	50.5	1.68
Castlewood.....	82	14	44.4	0.83	Piedmont.....	80	24	47.3	0.00
Clark.....	82	22	48.0	0.96	Pleasant Hill.....	80	24	47.3	0.00
Clarks.....	81	16	48.0	0.50	Point Pleasant.....	80	24	47.3	0.00
Cross.....	81	16	48.0	0.50	Rowlesburg (1).....	80	24	47.3	0.00
D. Smet.....	81	16	48.0	0.50	Tyler Creek.....	62	21	45.8	3.17
Elkton.....	78	20	44.6	1.33	Weston.....	62	21	45.8	3.17
Flandreau.....	80	19	47.0	1.48	Wheeling (1).....	85	31	54.0	1.56
Forestburg.....	82	20	48.0	0.87	Wheeling (2).....	85	31	54.0	1.56
Forest City.....	95	20	51.2	1.49	Wisconsin.				
Fort Bennett.....	82	23	49.9	1.63	Amherst.....	76	22	45.2	1.62
Fort Meade.....	80	21	51.1	0.41	Appleton (1).....	80	26	47.8	1.53
Fort Randall.....	86	23	52.9	0.79	Baraboo.....	78	26	48.1	2.78
Fort Sully.....	80	20	49.4	0.53	Barron.....	76	17	44.4	1.90
Frankfort.....	86	21	48.4	0.69	Bayfield.....	75	29	49.2	2.72
Gary.....	80	21	47.8	0.83	Beloit.....	86	27	48.3	2.10
Howard.....	82	23	48.0	1.10	Berlin.....	86	27	48.3	2.10
Kimball.....	84	22	49.6	0.67	Black River Falls.....	78	18	45.9	1.86
Millbank.....	84	20	49.6	0.67	Butternut.....	70	22	44.3	2.40
Mitchell.....	84	18	49.0	1.09	Arizona.				
Delrich.....	76	11	46.3	1.06	Bisbee.....	85	43	63.9	0.00
Onida.....	80	22	43.8	1.06	Dudleyville.....	94	42	70.9	0.00
Sioux Falls.....	82	18	48.9	1.35	Natural Bridge.....	94	42	70.9	0.00
Spearfish.....	81	23	49.0	1.23	Peoria.....	93	41	71.6	0.00
Tyndall.....	85	25	50.5	0.94	Reynert.....	93	41	72.7	0.00
Webster.....	88	15	50.5	1.69	Tempe.....	100	42	70.6	0.00
Wessington Spr'g.....	84	24	51.4	0.55	Whipple Barracks.....	82	23	56.4	0.00
Wolsey.....	86	22	47.0	0.75	California.				
Tennessee.					National City.....	91	50	65.9	0.02
Andersonville.....	89	26	56.2	0.95	Salinas (1).....	82	40	55.9	0.17
Arlington.....	94	30	56.4	0.53	Connecticut.				
Ashwood.....	86	30	57.4	1.07	Newington.....	79	29	53.2	2.14
Austin.....	88	24	57.2	0.61	District of Columbia.	78	29	53.4	1.85
Bethel Springs.....	84	42	58.6	1.15	Distributing Res'r.....	78	29	53.4	1.85
Bolivar (2).....	89	32	60.6	0.05	Receiving Res'r.....	78	29	53.4	1.85
Brownville.....	89	30	60.0	0.42	Florida.				
Charleston.....	86	29	57.0	0.73	De Land (1).....	86	38	66.8	0.00
Clarksville.....	86	29	57.0	0.73	Georgia.				
Clinton.....	86	29	57.0	0.73	Athens (1).....	84	34	58.9	0.16
Columbia.....	86	29	57.0	0.73	Utah.				
Covington (1).....	87	34	59.2	1.35	Blue Creek.....	70	39	48.0	0.00
Covington (2).....	81	33	61.3	0.58	Corinne.....	72	32	48.6	0.02
Dyersburg (2).....	90	29	59.0	1.61	Fort Douglas.....	77	30	53.5	1.27
Fayetteville.....	88	34	57.2	0.68	Kelton.....	66	24	43.7	1.10
Florence Station.....	87	34	58.2	0.81	Ogden (1).....	72	28	50.3	0.25
Franklin.....	89	29	57.6	0.90	Promontory.....	74	31	48.3	0.10
Grand Junction.....	86	31	59.1	0.65	Provo City.....	75	35	52.0	0.42
Greenville.....	78	28	51.8	1.12	Terrace.....	75	35	52.0	0.42
					Vermont.				
					Brattleborough (1).....	85	19	46.9	2.75
					Burlington.....	82	27	49.2	3.02
					Chelsea.....	74	13	41.2	2.43
					Enosburgh Falls.....	84	16	45.0	2.23
					Hartland.....	85	13	43.7	2.50

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
<i>Vermont—Cont'd.</i>					<i>Wisconsin—Cont'd.</i>				
Jacksonville.....	88	16	42.4	2.79	Cadiz.....	89	25	46.4	0.18
Lunenburg.....	83	20	46.6	0.51	Chippewa Falls.....	89	25	46.4	0.18
Stratford.....	83	20	46.6	0.51	Columbus.....	89	25	46.4	0.18
Vernon.....	80	18	46.3	2.02	Cumberland.....	89	25	46.4	0.18
Weatherfield C'tre	79	18	44.4	0.00	Delevan.....	89	25	46.4	0.18
Virginia.					De Pere.....	83	28	48.9	1.46
Abingdon.....	81	33	55.2	1.52	Dodgeville.....	89	25	46.4	1.92
Bedford City.....	81	33	55.2	1.52	Eau Claire (1).....	77	23	47.4	3.10
Big Stone Gap.....	84	22	48.2	1.81	Embarrass.....	76	22	46.9	3.15
Birdsneest.....	85	33	58.0	1.55	Florence.....	74	22	43.2	1.63
Cape Charles.....	85	33	58.0	1.55	Fond du Lac.....	89	25	47.3	1.63
Christiansburg.....	85	33	58.0	1.55	Hammond.....	79	22	49.2	1.92
Clarksville.....	85	33	58.0	1.55	Harvey.....	89	26	49.4	2.25
Dale Enterprise.....	82	29	54.6	0.89	Hayward.....	73	14	41.6	2.16
Danville.....	82	29	54.6	0.89	Hillsborough.....	78	22	46.8	2.03
Fort Monroe.....	87	35	57.0	5.93	Honey Creek.....	86	26	49.7	2.00
Fort Myer.....	84	26	53.9	1.99	Janesville.....	87	26	50.2	2.35
Lexington.....	82	26	52.3	0.48	Juneau.....	90	24	47.8	2.01
Marion.....	79	25	49.8	2.09	Koepenick.....	70	28	45.1	3.00
Massing Ford.....	75	29	53.0	2.81	Lincoln.....	83	19	45.4	1.49
Notaway C. H.....	82	25	55.3	1.73	Madison.....	83	19	45.4	1.49
Petersburg.....	88	29	55.5	2.61	Manitowoc.....	70	24	49.4	1.70
Richmond.....	92	26	59.8	3.04	Mauston.....	73	31	46.8	0.00
Salem.....	78	35	53.3	0.83	Meadow Valley.....	80	22	48.4	1.53
Spottsville.....	84	28	55.0	6.29	Medford (1).....	74	18	44.6	3.06
Stannardsville.....	86	28	56.0	0.76	Medford (2).....	77	19	46.9	4.16
Staunton.....	88	25	51.7	0.84	Menomonie.....	74	19	45.4	3.49
Woodstock.....	80	29	51.6	1.89	Neillsville.....	77	19	45.4	3.49
Wytheville.....	80	29	51.6	1.89	Oconomowoc.....	87	26	50.2	2.57
Washington.					Oconto.....	81	25	48.6	1.15
Aberdeen.....	85	42	55.2	6.69	Oscola Mills.....	76	17	47.2	1.66
Chehalis.....	89	34	54.3	4.44	Oshkosh.....	78	28	50.2	1.82
Chelan.....	71	34	53.6	0.32	Peshigo.....	81	22	46.2	1.38
East Sound.....	66	43	53.2	1.47	Phillips.....	79	16	44.4	1.10
Fort Canby.....	74	42	56.2	5.75	Plover.....	79	16	44.4	1.10
Fort Simcoe.....	80	40	58.5	0.58	Portage (1).....	79	16	44.4	1.10
Fort Spokane.....	82	23	52.1	0.66	Prairie du Chien.....	81	25	52.2	1.82
Fort Townsend.....	67	31	51.4	1.12	Rhineland.....	73	20	44.2	3.92
Fort Walla Walla.....	81	31	55.8	0.43	Shawano.....	77	21	45.7	1.23
Madrone.....	68	34	52.8	1.88	Shell Lake.....	77	21	43.6	1.33
Moxee Valley.....	89	23	53.9	0.68	Sparta (1).....	77	21	47.2	1.76
Pomeroy.....	78	38	55.4	0.54	Sparta (2).....	77	18	50.0	1.63
Tacoma.....	76	36	53.6	5.17	Viroqua.....	74	26	48.8	1.87
Vancouver B'ks.....	89	38	56.1	4.52	Watertown.....	86	25	48.0	2.06
Vashon.....	80	40	53.4	0.71	Waukegan.....	79	23	47.4	2.02
Waterville.....	74	18	45.6	0.52	Westfield.....	80	23	47.4	2.02
West Virginia.					Weston.....	70	22	43.0	3.80
Bluefield.....	86	43	62.4	2.48	Whitehall.....	78	24	48.8	4.29
Buckhannon (1).....	72	26	46.0	2.62	Wyoming.				
Buckhannon (2).....	72	26	46.0	2.62	Camp Pilot Butte.....	70	11	40.6	0.25
Charleston.....	81	27	50.5	1.65	Evanston.....	79	13	46.6	0.05
Ella.....	88	27	51.2	2.39	Fort D. A. Russell.....	75	6	41.8	T.
Glennville.....	88	27	51.2	2.39	Fort Fetterman.....	68	19	47.4	0.10
Grafton.....	88	27	51.2	2.39	Fort McKinney.....	76	15	46.8	0.25
Harpers Ferry.....	80	24	45.8	1.55	Fort Washakie.....	75	15	43.9	3.50
Hinton.....	82	32	50.4	T.	Fort Yellowstone.....	69	17	41.3	1.43
Kingwood.....	82	32	50.4	T.	Grand View.....	77	17	47.1	0.91
Martinsburg.....	82	32	50.4	T.	Lander.....	78	18	47.0	1.25
Morgantown (1).....	93	27	52.6	2.20	Laramie (2).....	68	14	43.2	0.30
Morgantown (2).....	93	27	52.6	2.20	Lusk.....	74	14	43.6	0.11
Nuttallburgh.....	90	28	55.4	2.02	Saratoga.....	75	9	41.5	1.10
Piedmont.....	84	26	50.5	1.68	Sheridan.....	74	14	42.1	1.18
Pleasant Hill.....	80	24	47.3	1.73	Sundance.....	74	13	45.8	0.66
Point Pleasant.....	80	24	47.3	1.73	Wheatland.....	80	18	45.6	0.60
Roxburg (1).....	62	21	45.8	3.17	Hawaiian Islands.				
Roxburg (2).....	62	21	45.8	3.17	Honolulu.....	90	68	77.2	4.64
Tyler Creek.....	62	21	45.8	3.17	Mexico.				
Weston.....	85	31	54.0	1.56	La Logia.....	98	62	81.3	0.11
Wheeling (1).....	85	31	54.0	1.56	Leon de Aldemas.....	81	37	61.8	0.02
Wheeling (2).....	85	31	54.0	1.56	Pueblo.....	74	40	50.0	0.83
Wisconsin.					Topolobampo.....	59	75	83.6	0.00
Amherst.....	76	22	45.2	1.62	New Brunswick.				
Appleton (1).....	80	26	47.8	1.53	Saint John.....	60	22	44.7	6.81
Baraboo.....	78	26	48.1	2.78	Newfoundland.				
Barron.....	76	17	44.4	1.90	Saint Johns.....	70	28	44.4	10.91
Bayfield.....	75	29	49.2	2.72	West Indies.				
Beloit.....	86	27	48.3	2.10	Grand Turk Island.....				5.08
Berlin.....	86	22	48.8	1.90	Hamilton, Bermuda.....	79	60	72.6	10.99
Black River Falls.....	78	18	45.9	1.86					
Butternut.....	70	22	44.3	2.40					
Reports received too late to be used in general discussion of weather for October, 1891.									
<i>Arizona.</i>					<i>Idaho.</i>				
Bisbee.....	85	43	63.9	0.00	Era.....	73	16	44.8	0.07
Dudleyville.....	94	42	70.9	0.00	Illinois.				
Natural Bridge.....	93	41	71.6	0.00	Irishtown.....				1.69
Peoria.....	93	41	72.7	0.00	Kansas.				
Reynert.....	100	42	70.6	0.00	Weskan (2).....	83	23	51.9	T.
Tempe.....	82	23	56.4	0.00	Louisiana.				
Whipple Barracks.....	82	23	56.4	0.00	Abbeville.....	91	41	67.4	1.05
California.					Olinton.....				1.21
National City.....	91	50	65.9	0.02	Donaldsonville.....	90	42	65.2	0.92
Salinas (1).....	82	40	55.9	0.17	Edgard.....	86	43	66.8	0.17
Connecticut.					Grand Cane.....	85	38	61.8	0.70
Newington.....				3.89	Jeanette.....	94	33	65.2	0.90
District of Columbia.					Lake Charles.....	87	38	62.4	0.30
Distributing Reservoir.....	79	29	53.2	2.14	Lawrence.....	86	46	68.6	1.02
Receiving Reservoir.....	78	29	53.4	1.85	Mandeville.....	90	39	69.0	0.68
Florida.					Maurepas.....	86	35	62.0	0.15
De Land.....	86	38	66.8	0.00	Melville.....	92	37	64.0	1.48
Georgia.					New Iberia.....	88	39	65.4	0.53
Athens (1).....	84	34	58.9	0.16	N. La. Exp. Station.....	87	31	61.3	0.48

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
Louisiana—Cont'd.	°	°	°	In.	Utah—Cont'd.	°	°	°	In.
Paincourtville.....	88	38	64.2	0.00	Castle Gate f.....	72	26	46.0	0.00
Shell Beach.....	87	44	64.6	0.00	Cisco f.....	79	24	52.6	0.03
Thibodeaux.....				1.06	Deseret f.....	79	17	46.7	0.05
West End.....				2.80	Fort Du Chesne.....	74	18	45.4	0.00
Winnsborough.....	93	26	59.9	0.00	Green River f.....	76	25	51.6	0.00
Maryland.					Lake Park.....	74	27	48.6	0.20
Great Falls*.....	80	27	53.2	1.14	Levan.....			45.2	0.00
Michigan.					Logan.....	80	26	52.4	0.20
Berrien Springs(1)*	86	32	51.7	0.73	Losee f.....	74	21	45.7	0.00
Lansing.....	84	26	48.9	0.77	Monaf.....	76	27	50.4	T.
Montana.					Mount Carmel* f.....	76	25	51.0	0.00
Fort Assiniboine.....	78	19	47.7	0.55	Nepht.....	76	15	47.4	T.
New Mexico.					Ogden(2) f.....			54.7	0.26
Eddy* f.....	98	40	67.5	0.00	Park City f.....			43.0	0.13
New York.					Parowan f.....	80	21	51.5	0.00
Rondout f.....	81	25	49.7	3.63	Richfield f.....	77	16	49.4	T.
Middleburgh.....	89	22	48.4	3.00	Saint George f.....	90	35	61.7	0.00
North Carolina.					Scofield f.....	70	16	37.8	0.00
Lexington f.....	89	23	55.4	1.17	Snowville f.....	71	31	54.2	0.06
North Dakota.					Soldier Summit f.....				0.03
Kelso.....	73	20	44.8	2.60	Stockton f.....			43.8	
Ohio.					Washington.				
Bement.....	90	25	47.8	1.14	Doe Bay f.....	63	43	52.9	1.13
Hassan*.....	88	31	52.0	2.12	West Virginia.				
South Carolina.					Tannery *.....	85	26	50.6	
Simpsonville.....	81	34	53.6	0.29	White Sulph. Spgs f.....				2.00
Tennessee.					Wyoming.				
Harriman f.....	90	25	58.4	0.76	Laramie (1).....	66	15	41.4	0.69
Texas.					Mario.				
Fort Brown.....	88	50	71.6	2.94	Leon de Aldemas..	81	37	61.4	0.02
Utah.					Masatlan.....	88	59	80.2	0.17
Beaver f.....	87	20	53.0	T.	Mexico.....	74	38	56.0	1.71

Received too late for publication in September, 1891.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
Arizona.	°	°	°	In.	Nebraska.	°	°	°	In.
Bisbee *.....	91	50	71.2	0.67	Bassett.....	92	47	65.1	0.85
California.					Oakdale.....	91	32	65.8	0.77
Alcalde *.....	106	52	76.1	0.00	Nevada.				
Claremont *.....	104	55	76.9	0.00	Elko (1).....	92	28	63.9	0.40
Davisville *.....	102	52	70.9	0.00	Toano.....	85	35	61.8	1.13
Newark *.....	90	53	68.2	0.20	New Mexico.				
Napa City (1) *.....	93	51	64.8	0.58	Deming.....	100	60	73.5	0.80
Ontario *.....	105	52	77.2	0.00	El Rito.....				1.98
Pleasanton *.....	95	50	67.3	0.00	New York.				
Red Bluff *.....	100	50	71.8	0.00	Rondout.....	86	43	63.6	1.77
Redding (1) *.....	108	46	71.4	0.13	North Carolina.				
Sisson *.....	93	38	57.2	1.32	Mount Pleasant.....	91	52	70.6	0.95
Woodland *.....	96	50	68.2	0.00	Utah.				
Indiana.					Nepht.....	88	31	60.6	2.81
Rushville.....				2.13	Wisconsin.				
Michigan.					Beloit.....	92	40	67.3	0.03
Berrien Springs(1)*	92	44	67.2	1.40	Wyoming.				
Missouri.					Grandview.....	87	30	58.8	1.03
Cape Girardeau.....				0.00	Mexico.				
Centerville.....	90	30		1.10	La Logia.....	102	72	86.9	2.83

Letters of the alphabet denote the number of days missing from the record, thus: the letter c indicates three days missing, etc., etc.

* Extremes of temperature from observed readings.

† Weather Bureau instruments.

Corrections: September, 1891, Long Bridge, District of Columbia, make precipitation 2.66 instead of 0.15.

Data from Canadian stations for the month of October, 1891.

Station.	Pressure.			Temperature.		Precipitation.		Prevailing direction of wind.
	Mean not reduced.	Mean reduced.	Departure from normal.	Mean.	Departure from normal.	Total.	Departure from normal.	
	Inches.	Inches.	Inches.	°	°	Inches.	Inches.	
Saint John's, N. F.....	29.82	29.97	— .10	44.1	— 1.7	10.85	— .05	ne.
Sydney, N. S.....	29.88	29.94	— .06	47.6	+ 1.9	10.25	+ 5.95	sw.
Anticosti, Gulf of St. L.....	29.86	29.99	— .09	47.5	+ 1.5	9.61	+ 4.22	w.
Halifax, N. S.....	29.90	29.95	— .05	46.4	— .05	8.90	+ 4.22	w.
Grand Manan, N. B.....	29.91	29.99	— .09	47.0	— 0.5	7.53	+ 3.50	n.
Yarmouth, N. S.....	29.94	29.99	— .05	44.6	— 0.6	4.46	+ 1.11	sw.
Saint Andrews, N. B.....	29.92	29.96	— .04	46.6	— .04	6.26	+ 1.78	sw.
Charlottetown, P. E. I.....	29.95	29.98	— .03	42.3	+ 1.8	4.66	+ 0.77	sw.
Chatham, N. B.....	29.98	30.01	— .01	39.6	+ 0.6	2.34	— 0.28	n.
Father Point, Que.....	29.70	30.04	— .02	41.8	+ 0.8	1.98	— 1.67	nw.
Quebec, Que.....	29.84	30.05	— .03	44.1	+ 0.6	2.53	— 1.08	sw.
Montreal, Que.....	29.56	30.03	— .03	39.6	+ 0.6	2.80	+ 0.10	nw.
Rockliffe, Ont.....	29.74	30.06	— .02	46.6	+ 0.6	1.61	— 1.39	ne.
Kingston, Ont.....	29.70	30.08	— .02	46.6	+ 1.1	1.71	— 0.58	nw.
Toronto, Ont.....	29.70	30.08	— .02	46.6	+ 1.1	1.71	— 0.58	nw.
White River, Ont.....	29.70	30.08	— .02	46.6	+ 1.1	1.71	— 0.58	nw.
Port Stanley, Ont.....	29.44	30.08	— .04	47.0	— .04	2.74	— 0.54	w.
Saugeen, Ont.....	29.36	30.08	— .02	45.8	+ 0.8	2.19	— 1.62	s.
Harry Sound, Ont.....	29.36	30.07	— .01	43.6	+ 1.1	1.68	— 2.64	w.
Port Arthur, Ont.....	29.30	30.01	— .01	40.8	+ 3.3	2.39	— 0.30	nw.
Winnipeg, Man.....	29.16	30.00	— .00	38.1	+ 1.6	1.05	— 0.68	s.
Minneapolis, Man.....	28.16	30.01	— .03	34.5	+ 1.0	0.90	— 0.65	nw.
Qu'Appelle, Assiniboia.....	27.73	30.03	— .03	30.6	+ 0.1	0.63	— 0.23	s.
Medicine Hat, Assiniboia.....	27.67	29.99	— .03	43.7	+ 1.7	0.20	— 0.97	sw.
Swift Current, Assiniboia.....	27.43	30.05	— .05	38.8	+ 0.8	2.07	— .07	nw.
Calgary, Alberta.....	26.44	30.00	— .05	42.1	+ 3.1	0.27	— .07	nw.
Prince Albert, Saskatch'n.....	28.42	30.06	— .02	34.8	— .02	1.06	— .06	n.
Esquimalt, B. C.....	30.04	— .02	— .02	50.6	+ 1.8	2.04	— 2.28	n.
Stony Mountain, Man.....	29.92	— .00	— .00	40.8	+ 1.7	1.02	— 0.02	w.
Port Moody, B. C.....	29.94	— .06	— .06	51.9	+ 2.2	5.13	— 1.88	w.
St. Albans, Man.....	28.73	— .00	— .00	42.5	+ 1.7	1.40	+ 0.39	.....
Edmonton, Alberta.....	27.64	30.00	— .00	39.8	— .00	0.44	— .00	nw.
Battleford, Saskatchewan.....	28.22	29.98	— .00	36.8	— .00	0.29	— .00	nw.
Grindstone, Gulf St. L.....	29.88	29.91	— .00	45.0	— .00	7.69	— .00	nw.
Hamilton, Bermuda.....	29.86	30.02	— .00	72.6	— .00	9.42	— .00	sw.

Table of miscellaneous meteorological data for October, 1891—Weather Bureau observations.

Districts and stations.	Elevation above sea-level, feet.	Length of record, years.	Pressure, in inches.		Temperature of the air, in degrees Fahrenheit.					Humidity and precipitation.					Wind.		Partly cloudy days.	Average cloudiness, tenths.	Mean temperature data since opening of station.												
			Mean pressure, 8 a. m. and 8 p. m. + 2.	Mean reduced.	Mean max. and min. + 2.	Departure from normal.	Maximum.	Date.	Mean minimum.	Greatest daily range.	Mean temperature of the dew-point.	Mean relative humidity, per cent.	Precipitation, in inches.	Departure from normal.	Days with .01 or more.	Total movement, miles.			Prevailing direction.	Miles per hour.	Direction.	Date.	Cloudless days.	Cloudy days.	Highest for month.	Year.	Lowest for month.	Year.			
New England.																															
Eastport.....	53	19	29.93	29.99	— .02	50.4	— 0.6	68	3	52	24	29	41	20	38	77	65.0	+ 1.2	7.489	n.	38	e.	8	7	11	13	6.6	50.3	1878	43.7	1888
Portland.....	99	20	29.92	30.02	— .02	47.4	+ 0.4	77	3	55	27	29	40	33	40	78	4.43	— 0.2	5.981	n.w.	32	n.	14	10	12	9	5.5	55.5	1879	43.4	1888
Manchester.....	247	5	29.78	30.05	— .02	48.4	— .77	89	4	59	22	29	38	41	37	73	2.16	— .08	4.207	n.w.	28	n.w.	23	11	11	9	4.9	48.4	1891	44.0	1888
Northfield.....	872	5	29.12	30.08	— .02	43.7	— .83	83	3	54	16	29	33	41	36	82	1.87	— .09	5.914	s.	42	n.	24	4	14	13	6.5	54.0	1890	39.0	1888
Boston.....	135	21	29.91	30.05	— .01	51.6	+ 0.1	83	5	56	28	29	44	27	42	75	5.59	+ 1.3	9.257	n.w.	40	n.w.	23	10	8	13	5.5	55.0	1879	47.4	1883
Nantucket.....	14	5	30.01	30.02	— .01	52.4	— .68	68	3	56	36	29	48	14	46	79	4.95	— .11	11.533	ne.	58	ne.	13	11	7	13	5.7	53.5	1887	49.4	1888
Woods Holl.....	22	14	30.01	30.02	— .01	52.0	— .70	70	4	57	31	29	46	18	46	79	7.09	+ 3.2	13.090	e.	61	ne.	14	7	11	13	6.2	58.1	1879	49.2	1888
Vineyard Haven.....	5	5	30.01	30.02	— .01	53.0	— .72	72	3	56	32	29	46	26	46	79	7.57	— .13	13.090	ne.	72	ne.	13	9	3	19	5.4	54.1	1890	50.4	1888
Block Island.....	27	12	30.01	30.04	— .07	53.1	— 1.2	74	5	58	34	29	48	16	47	82	7.33	+ 3.0	15.585	ne.	72	ne.	13	9	12	10	5.7	57.4	1882	49.7	1888
Narragansett Pier.....	22	10	29.93	30.05	— .03	52.2	— 0.1	76	5	60	25	29	45	29	43	78	5.24	+ 0.7	9.257	ne.	30	ne.	13	10	9	12	5.6	56.3	1882	47.8	1888
New Haven.....	107	19	29.93	30.05	— .03	50.8	— 1.5	83	5	60	26	29	42	28	43	78	4.62	+ 0.5	6.459	n.	30	ne.	13	10	9	12	5.4	58.7	1879	47.6	1888
New London.....	47	21	29.99	30.04	— .04	51.4	— 1.6	83	5	59	27	29	44	24	43	76	6.50	+ 2.0	6.171	n.	34	e.	20	8	14	9	5.6	58.4	1879	49.3	1888
Mid. Atlantic States.																															
Albany.....	85	18	29.98	30.08	+ .01	50.2	— 1.1	86	4	58	24	29	42	29	42	80	2.13	— 1.4	4.939	n.w.	34	n.w.	11	6	13	12	5.8	56.4	1882	45.6	1888
New York, N. Y.....	185	21	29.87	30.07	— .02	54.2	— 1.8	83	5	62	34	28	47	24	44	75	2.69	— 0.8	10.968	n.w.	42	n.w.	27	9	13	9	5.5	59.8	1879	49.7	1876
Harrisburg.....	377	4	29.70	30.12	— .02	52.4	— .85	85	4	61	32	29	44	31	41	71	2.87	— .11	4.958	n.w.	28	w.	10	12	5	14	5.3	58.8	1888	50.2	1889
Philadelphia.....	117	21	29.97	30.09	— .02	54.9	— 2.1	86	4	63	36	28	47	25	43	70	2.57	— 0.4	9.588	n.w.	36	n.w.	23	13	9	9	4.8	61.4	1879	50.4	1876
Atlantic City.....	53	18	30.03	30.08	— .01	54.6	— 1.7	85	5	61	30	29	48	25	48	79	5.39	+ 2.1	10.773	n.w.	47	ne.	12	13	9	9	4.6	61.2	1881	50.8	1876
New Brunswick.....	179	21	29.91	30.11	— .00	53.2	— .88	88	4	64	25	29	42	32	45	75	3.05	— .10	10.773	n.w.	36	n.w.	26	14	8	9	4.5	63.1	1881	51.8	1876
Baltimore.....	112	21	30.00	30.12	— .00	54.4	— 2.9	84	4	63	33	29	46	30	43	74	2.24	— 1.0	4.972	n.w.	34	n.w.	27	16	6	9	4.4	62.9	1881	50.7	1876
Washington, D. C.....	18	21	30.11	30.12	— .01	58.6	— 4.4	88	5	65	35	30	52	32	45	75	6.87	+ 3.1	14.000	n.w.	30	n.w.	22	10	9	6	4.4	65.2	1881	57.1	1876
Cape Henry.....	685	21	29.41	30.15	+ .04	54.8	— 3.5	88	4	65	30	29	44	40	42	71	6.82	— 2.8	9.341	n.w.	30	n.w.	22	10	9	6	4.4	65.2	1881	53.6	1876
Lynchburg.....	43	21	30.06	30.10	— .01	58.6	— 3.4	88	5	66	36	29	51	27	50	79	6.89	+ 3.0	6.740	n.	48	n.w.	22	14	8	9	4.6	66.8	1881	56.2	1876
S. Atlantic States.																															
Charlotte.....	773	12	29.32	30.15	+ .04	56.8	— 4.2	88	5	67	31	28	47	30	42	68	0.68	— 3.2	6.500	ne.	24	n.w.	22	19	6	6	3.4	66.4	1884	56.8	1891
Hatteras.....	11	11	30.08	30.10	— .01	62.2	— 3.1	81	1	66	44	28	58	18	55	81	7.74	+ 1.3	12.367	n.	72	n.	12	13	8	10	5.2	70.6	1881	61.0	1889
Kitty Hawk.....	9	16	30.06	30.07	— .01	60.3	— 4.1	84	5	66	40	23	55	24	54	80	2.79	— 1.3	10.136	ne.	78	ne.	12	9	11	11	5.3	68.3	1881	58.7	1876
Raleigh.....	388	5	29.72	30.14	— .02	56.4	— 3.8	88	5	66	32	29	47	32	47	77	2.64	— .10	9.942	n.	28	n.w.	27	18	5	8	4.1	60.3	1890	55.8	1888
Southport.....	34	16	30.07	30.10	— .03	60.4	— 4.5	80	4	68	36	28	53	25	55	85	6.40	+ 1.4	9.609	n.	25	e.	1	17	5	9	4.3	69.2	1881	60.4	1891
Wilmington.....	78	21	30.04	30.12	+ .02	60.6	— 4.1	89	5	70	36	29	52	31	51	79	6.01	+ 2.0	9.578	ne.	28	n.w.	22	15	10	6	3.9	69.8	1881	59.0	1876
Charleston.....	52	21	30.07	30.12	+ .02	63.8	— 3.9	89	5	71	42	28	56	26	54	79	4.20	— 0.2	6.390	n.	29	ne.	1	14	9	4	4.3	72.0	1881	62.0	1876
Columbia.....	209	20	29.94	30.17	+ .05	59.7	— 4.9	90	5	72	32	29	48	35	48	73	1.31	— .06	5.318	ne.	22	n.	22	19	6	6	3.7	70.6	1881	59.4	1875
Augusta.....	87	21	29.94	30.14	+ .03	63.4	— 4.3	89	5	72	41	28	55	30	52	76	2.46	— 1.3	3.816	ne.	26	se.	2	16	6	9	4.3	72.4	1881	62.1	1876
Savannah.....	43	21	30.06	30.11	+ .04	66.9	— 4.6	89	5	76	45	24	58	32	56	76	4.43	— 1.2	4.966	n.	24	w.	22	15	7	9	4.0	74.7	1881	65.7	1876
Florida Peninsula.																															
Jupiter.....	28	4	30.00	30.03	— .03	73.6	— 3.0	86	7	80	55	24	67	20	68	84	8.38	— .13	8.237	ne.	36	ne.	20	10	10	11	5.8	76.8	1888	73.6	1891
Key West.....	22	21	30.01	30.03	+ .04	70.0	— 3.0	86	1	79	67	24	72	14	68	78	6.42	+ 1.1	9.270	ne.	36	ne.	28	8	10	13	5.7	80.3	1881	76.0	1891
Mico.....	36	5	30.04	30.08	— .04	73.7	— 3.0	88	5	79	62	24	67	22	61	82	6.06	— .15	9.997	n.g.	19	n.	29	10	10	11	5.0	79.0	1881	76.0	1891
Tampa.....	44	5	30.03	30.07	— .04	70.8	— 3.4	84	5	77	51	25	65	29	63	80	8.28	— .15	9.694	ne.	36	ne.	28	15	7	9	4.5	74.8	1887	69.4	1889
Eastern Gulf States.																															
Atlanta.....	1,131	14	28.97	30.17	+ .03	59.4	— 2.6	84	4	69	36	23	50	30	43	62	0.02	— 2.7	6.971	n.w.	30	n.	22	22	5	4	2.6	67.8	1884	56.5	1885
Pensacola.....	56	12	30.07	30.13	+ .05	66.8	— 2.9	88	6	76	44	20	57	25	52	67	0.04	— 3.7	7.483	n.	27	n.	8	27	4	0	0.9	73.8	1884	64.7	1885
Auburn.....	11	11	30.12	30.16	+ .06	58.2	— .85	85	4	72	31	28	44	39	52	72	0.04	— .1	5.559	n.w.	25	n.	20	6	5	5	1.8	73.5	1881	62.5	1875
Mobile.....	35	21	30.12	30.16	+ .06	63.4	— 3.6	89	4	76	36	29	51	40	46	70	0.01	— 2.7	3.716	n.	20	n.	22	25	5	1	1.5	71.5	1884	60.4	1875
Montgomery.....	217	20	29.92	30.15	+ .05	59.6	— 3.6	88	4	74	29	23	45	45	46	70	0.07	— .3	3.606	ne.	24	n.	27	26	3	2	1.9	71.5	1881	60.4	

Table of miscellaneous meteorological data for October, 1891—Weather Bureau observations—Continued.

Districts and stations.	Elevation above sea-level, feet.	Length of record, years.	Pressure, in inches.			Temperature of the air, in degrees Fahrenheit.					Humidity and precipitation.					Wind.					Mean temperature data since opening of station.											
			Mean pressure, 8 a. m. and 8 p. m. + 2.	Mean reduced.	Departure from normal.	Mean max. and min. + 2.	Departure from normal.	Maximum.	Date.	Mean minimum.	Date.	Greatest daily range.	Mean temperature of the dew-point.	Mean relative humidity, per cent.	Precipitation, in inches.	Departure from normal.	Days with or more.	Total movement, miles.	Prevailing direction.	Maximum velocity.		Date.	Cloudless days.	Partly cloudy days.	Cloudy days.	Average cloudiness, tenths.	Highest for month.	Year.	Lowest for month.	Year.		
																				Miles per hour.	Direction.											
<i>Gr. Northwest—Con.</i>																																
Saint Vincent	824	12	29.12	30.00	-.00	43.0	+ 3.0	71	9	53	30	15	33	35	32	77	2.38	+ 0.1	11	8,261	nw.	43	se.	11	10	8	13	5.6	45.7	1886	35.0	1887
Bismarck	1,698	18	28.21	30.05	+.05	45.8	+ 1.8	78	28	58	23	15	34	46	32	70	0.99	+ 0.1	8	8,246	nw.	54	nw.	30	12	10	9	4.9	48.8	1879	40.2	1878
Fort Buford	1,899	13	28.01	30.06	+.05	42.4	+ 1.1	75	27	54	15	3	30	39	31	70	1.06	+ 1.0	10	5,931	nw.	36	nw.	30	13	8	10	4.8	47.2	1889	38.6	1881
<i>Upper Miss. Valley.</i>																																
Minneapolis	758	21	29.25	30.08	+.08	50.0	0.0	74	2	60	29	22	40	30	36	69	1.67	0.0	7	6,887	sw.	54	w.	31	12	13	6	4.7	50.0	1889	42.3	1887
Red Wing	850	21	29.16	30.09	+.08	48.2	+ 0.7	77	2	57	24	22	39	33	37	72	1.57	+ 0.3	8	5,116	se.	39	sw.	31	8	12	11	5.5	56.9	1879	42.3	1887
Saint Paul	730	19	29.32	30.10	+.10	50.2	+ 0.7	78	2	59	27	21	41	38	38	68	1.87	+ 0.5	8	4,899	se.	28	nw.	31	12	8	11	5.3	58.5	1879	43.7	1887
Davenport	613	20	29.48	30.14	+.14	53.1	+ 0.9	87	2	63	31	23	44	34	38	68	1.37	+ 1.7	7	6,725	sw.	34	nw.	31	17	6	8	3.6	59.8	1879	47.5	1887
Des Moines	869	14	29.19	30.12	+.12	53.2	+ 0.4	81	25	63	26	22	42	35	38	68	2.41	+ 1.2	8	5,868	nw.	32	sw.	29	20	5	6	5.0	59.6	1879	48.4	1887
Dubuque	651	19	29.41	30.12	+.12	51.0	+ 0.3	87	2	60	29	20	42	37	41	75	2.20	+ 0.9	6	2,870	nw.	25	w.	31	12	11	8	3.8	65.2	1879	46.3	1887
Keokuk	613	21	29.47	30.13	+.13	54.5	+ 0.5	89	1	65	33	23	44	34	40	68	1.49	+ 1.8	6	4,730	nw.	26	nw.	31	21	6	4	3.4	61.6	1879	49.4	1887
Cairo	359	21	29.79	30.18	+.18	58.0	+ 1.7	88	1	68	33	23	48	36	45	70	0.49	+ 2.5	5	5,599	nw.	37	n.	27	20	6	5	3.8	65.2	1879	53.7	1873
Springfield, Ill.	644	13	29.45	30.14	+.14	54.4	+ 0.6	88	1	65	32	23	44	34	40	68	1.88	+ 1.6	6	6,403	nw.	32	nw.	26	18	11	2	3.0	62.6	1879	50.4	1887
Saint Louis	371	21	29.35	30.16	+.16	57.6	+ 0.6	88	1	67	37	15	48	33	43	68	0.65	+ 2.0	6	8,289	sw.	30	nw.	6	31	7	3	3.4	62.8	1879	52.0	1873
<i>Missouri Valley.</i>																																
Columbia	561	1	29.12	30.15	+.15	56.1	0.0	92	*	71	25	6	41	45	41	64	1.51	0.0	6	5,051	nw.	24	se.	16	25	2	4	4.1	56.7	1891	54.6	1888
Kansas City	963	4	29.12	30.15	+.15	56.7	0.0	88	3	67	32	15	46	32	41	64	0.83	0.0	7	6,556	se.	28	se.	30	21	5	5	3.0	56.7	1891	54.6	1888
Springfield, Mo.	1,350	6	28.72	30.16	+.16	57.4	0.0	87	1	70	30	7	45	43	41	66	0.77	0.0	3	7,462	se.	36	nw.	18	18	10	3	2.8	61.2	1882	54.2	1888
Leavenworth	842	21	29.26	30.16	+.16	55.9	+ 0.1	89	2	68	30	15	44	42	40	66	1.39	+ 1.9	6	4,837	nw.	30	se.	16	21	7	3	3.2	62.0	1879	50.6	1873
Topeka	558	5	29.26	30.16	+.16	55.8	+ 0.1	90	2	71	27	15	41	48	40	66	1.58	0.0	7	4,837	nw.	30	se.	16	21	7	3	3.2	62.0	1879	50.6	1873
Omaha	1,113	21	28.95	30.15	+.15	53.2	+ 0.4	84	25	63	31	15	43	35	38	66	5.37	+ 2.8	10	5,723	nw.	24	nw.	17	15	9	7	4.1	61.5	1879	48.4	1873
Crete	2,613	7	27.37	30.12	+.12	50.6	+ 1.3	84	25	63	31	15	43	35	38	66	5.37	+ 2.8	10	5,723	nw.	24	nw.	17	15	9	7	4.1	61.5	1879	48.4	1873
Valentine	1,158	7	27.37	30.12	+.12	50.6	+ 1.3	84	25	63	31	15	43	35	38	66	5.37	+ 2.8	10	5,723	nw.	24	nw.	17	15	9	7	4.1	61.5	1879	48.4	1873
Sioux City	1,470	11	28.66	30.07	+.07	50.1	+ 1.5	81	23	63	27	*	37	47	31	63	1.01	0.0	7	5,476	nw.	42	w.	30	15	8	8	4.2	50.0	1889	44.6	1887
Pierre	1,470	11	28.66	30.07	+.07	50.1	+ 1.5	81	23	63	27	*	37	47	31	63	1.01	0.0	7	5,476	nw.	42	w.	30	15	8	8	4.2	50.0	1889	44.6	1887
Huron	1,310	11	28.66	30.07	+.07	50.1	+ 1.5	81	23	63	27	*	37	47	31	63	1.01	0.0	7	5,476	nw.	42	w.	30	15	8	8	4.2	50.0	1889	44.6	1887
Yankton	1,332	19	28.78	30.11	+.11	51.8	+ 1.8	86	29	64	26	15	40	44	35	60	0.62	+ 1.0	4	7,373	nw.	36	se.	2	12	15	4	4.3	58.9	1879	45.2	1876
<i>Northern Slope.</i>																																
Fort Assiniboine	2,690	12	27.21	30.06	+.06	47.2	+ 3.7	79	27	60	19	31	35	43	30	63	0.59	+ 0.1	6	7,930	sw.	35	nw.	16	8	16	7	5.7	49.0	1889	36.2	1881
Miles City	2,374	12	27.21	30.06	+.06	47.2	+ 3.7	79	27	60	19	31	35	43	30	63	0.59	+ 0.1	6	7,930	sw.	35	nw.	16	8	16	7	5.7	49.0	1889	36.2	1881
Helena	4,118	12	25.89	30.12	+.12	47.8	+ 2.8	75	27	58	19	2	37	35	28	54	2.40	+ 1.6	7	5,214	sw.	42	sw.	10	7	14	10	3.8	50.7	1889	37.9	1881
Rapid City	3,280	6	26.70	30.09	+.09	50.1	+ 1.0	74	27	60	19	31	35	43	30	63	0.59	+ 0.1	6	7,930	sw.	35	nw.	16	8	16	7	5.7	49.0	1889	36.2	1881
Cheyenne	6,103	21	24.14	30.17	+.17	47.0	+ 1.0	74	27	60	19	31	35	43	30	63	0.59	+ 0.1	6	7,930	sw.	35	nw.	16	8	16	7	5.7	49.0	1889	36.2	1881
Fort McKinney	5,000	4	25.12	30.15	+.15	48.3	+ 1.0	73	28	59	22	2	38	37	28	55	0.59	+ 0.1	6	7,930	sw.	35	nw.	16	8	16	7	5.7	49.0	1889	36.2	1881
Lander	5,371	21	24.77	30.22	+.22	42.6	+ 1.1	73	28	59	22	2	38	37	28	55	0.59	+ 0.1	6	7,930	sw.	35	nw.	16	8	16	7	5.7	49.0	1889	36.2	1881
North Platte	2,841	18	27.18	30.16	+.16	51.3	+ 1.1	83	23	68	22	6	35	50	25	62	0.37	+ 0.5	3	5,691	w.	38	nw.	1	22	7	2	2.6	55.2	1879	44.5	1877
<i>Middle Slope.</i>																																
Denver	5,287	20	24.88	30.16	+.16	52.2	+ 1.2	78	19	67	26	31	38	41	20	38	0.48	+ 0.3	6	4,998	se.	30	nw.	16	22	8	1	2.7	55.5	1884	45.7	1873
Pueblo	4,734	4	25.38	30.14	+.14	52.8	+ 0.8	81	1	69	28	31	36	50	23	41	0.96	+ 0.5	5	4,180	nw.	44	sw.	1	21	8	2	2.8	53.2	1889	50.6	1890
Concordia	1,410	7	28.65	30.16	+.16	54.6	+ 0.2	86	25	68	29	7	42	41	40	73	5.24	+ 3.6	7	5,081	se.	30	se.	11	24	4	3	2.3	59.7	1886	50.9	1885
Dodge City	2,323	18	27.50	30.15	+.15	53.2	+ 0.6	85	23	69	32	9	41	48	37	65	3.33	+ 2.1	6	6,170	se.	44	se.	11	23	4	4	2.4	59.6	1884	50.8	1883
Wichita	1,366	4	28.69	30.15	+.15	57.8	+ 0.3	87	25	70	32	7	45	40	39	61	2.95	0.0	6	6,574	se.	30	se.	29	24	5	2	1.8	58.0	1890	56.4	1889
Oklahoma City	1,439	1	28.86	30.17	+.17	60.8	+ 0.2	92	26	74	33	7	48	39	39	56	0.31	0.0	4	7,186	se.	34	se.	1	25	4	2	1.5	58.0	1890	56.4	

Chart I. Tracks of Areas

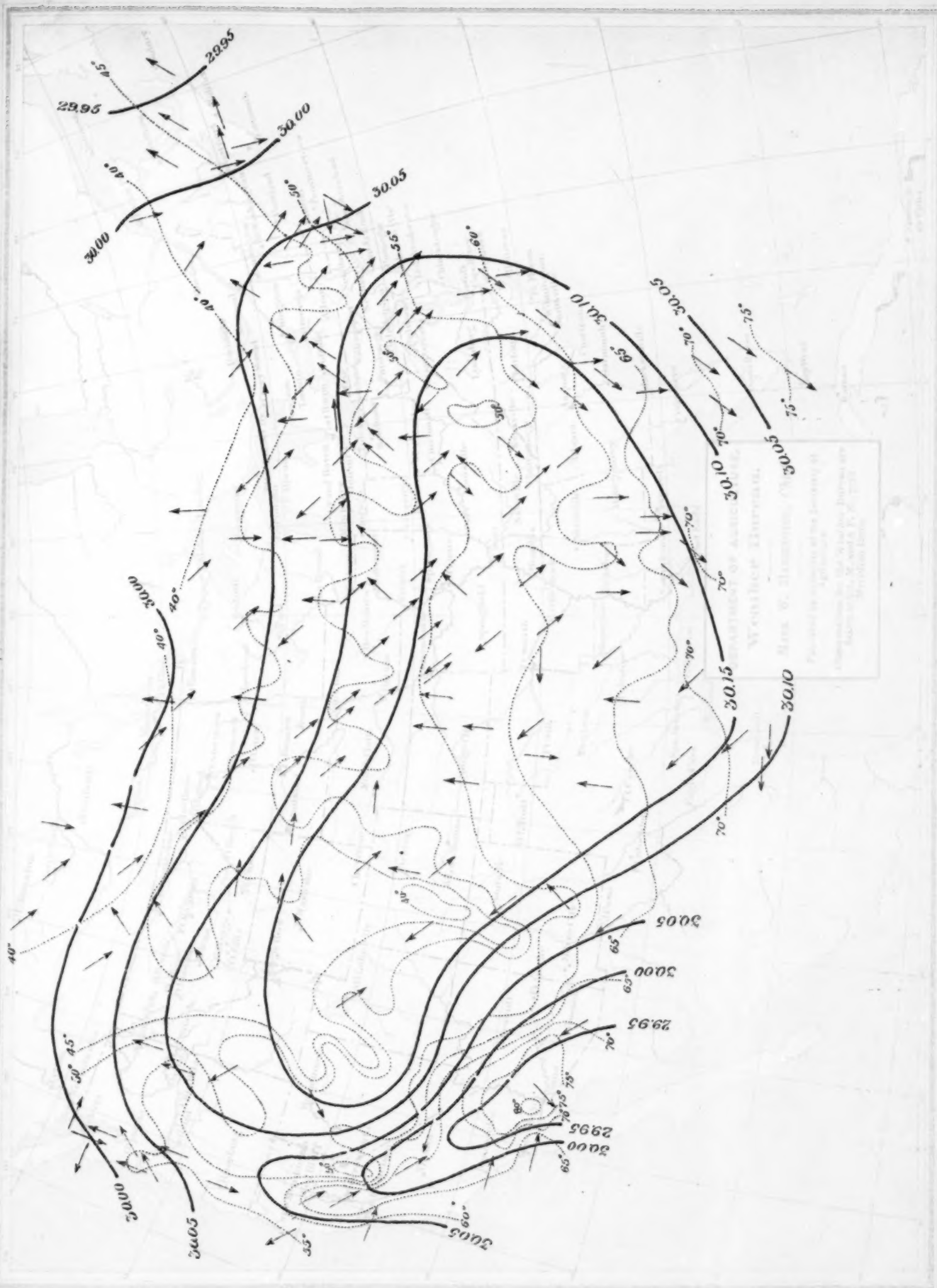


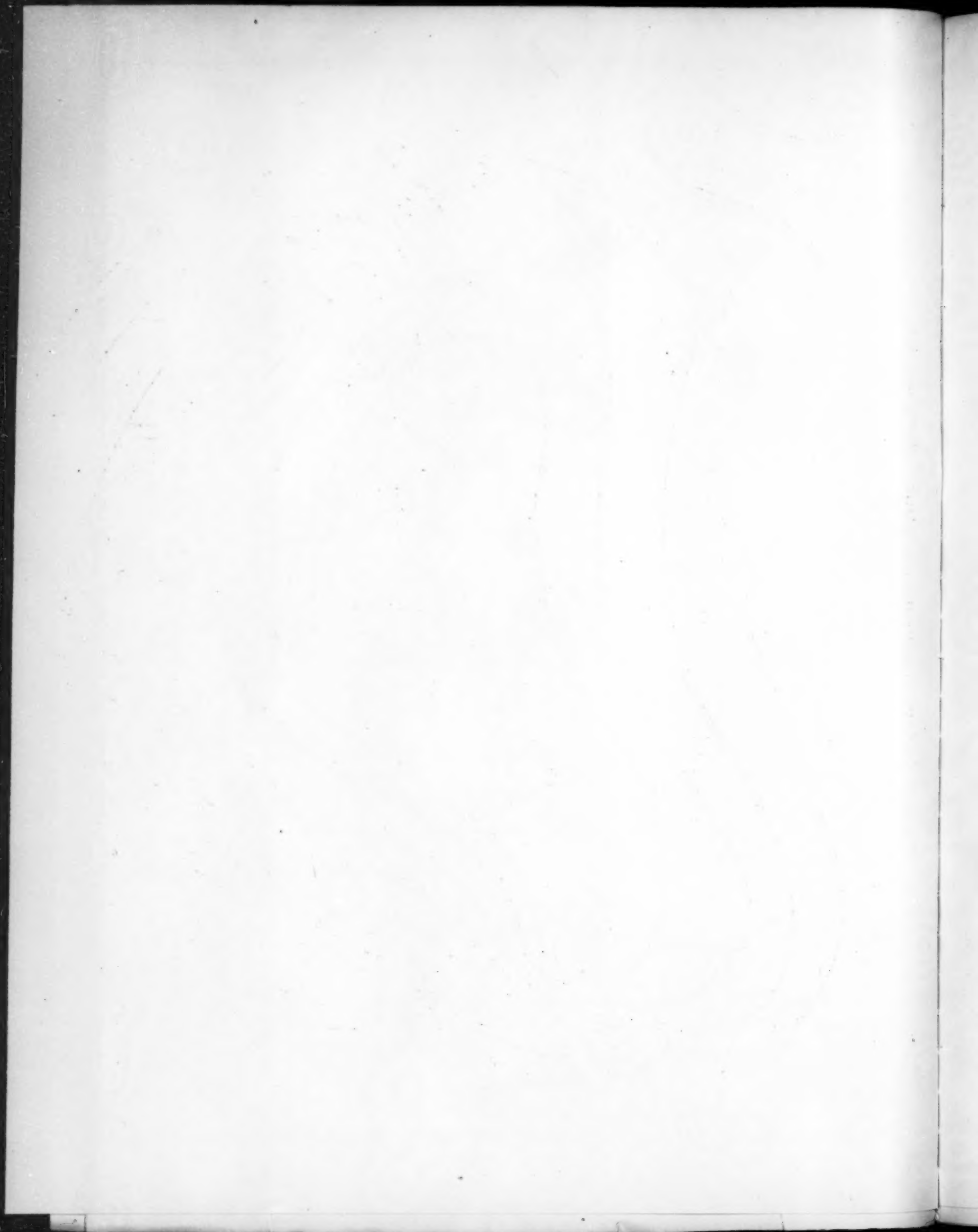
Chart I. Tracks of Areas of Low Pressure. October, 1891.





Chart II. Isobars, Isotherms, and Winds, October, 1891,





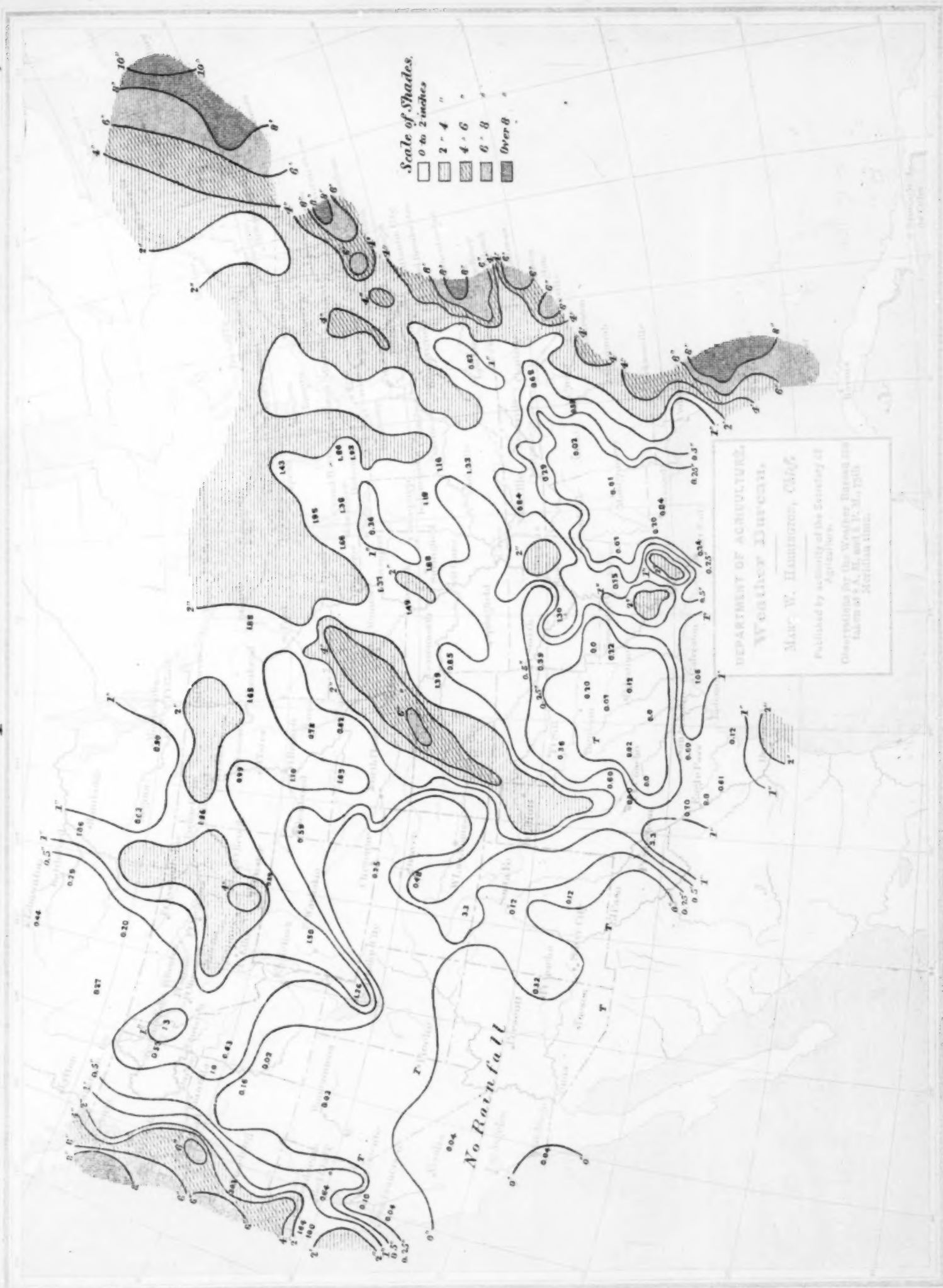
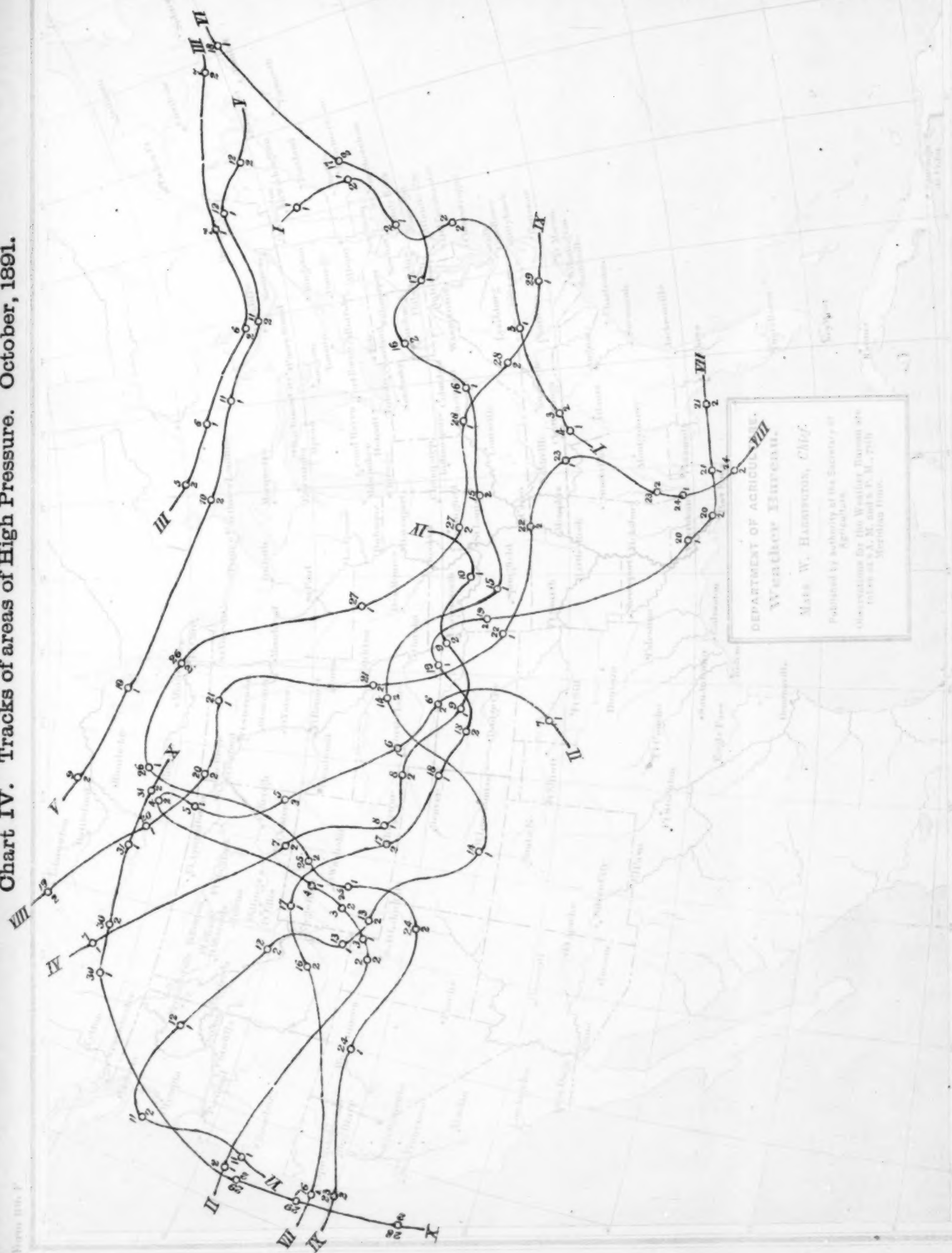


Chart IV. Tracks of areas of High Pressure. October, 1891.



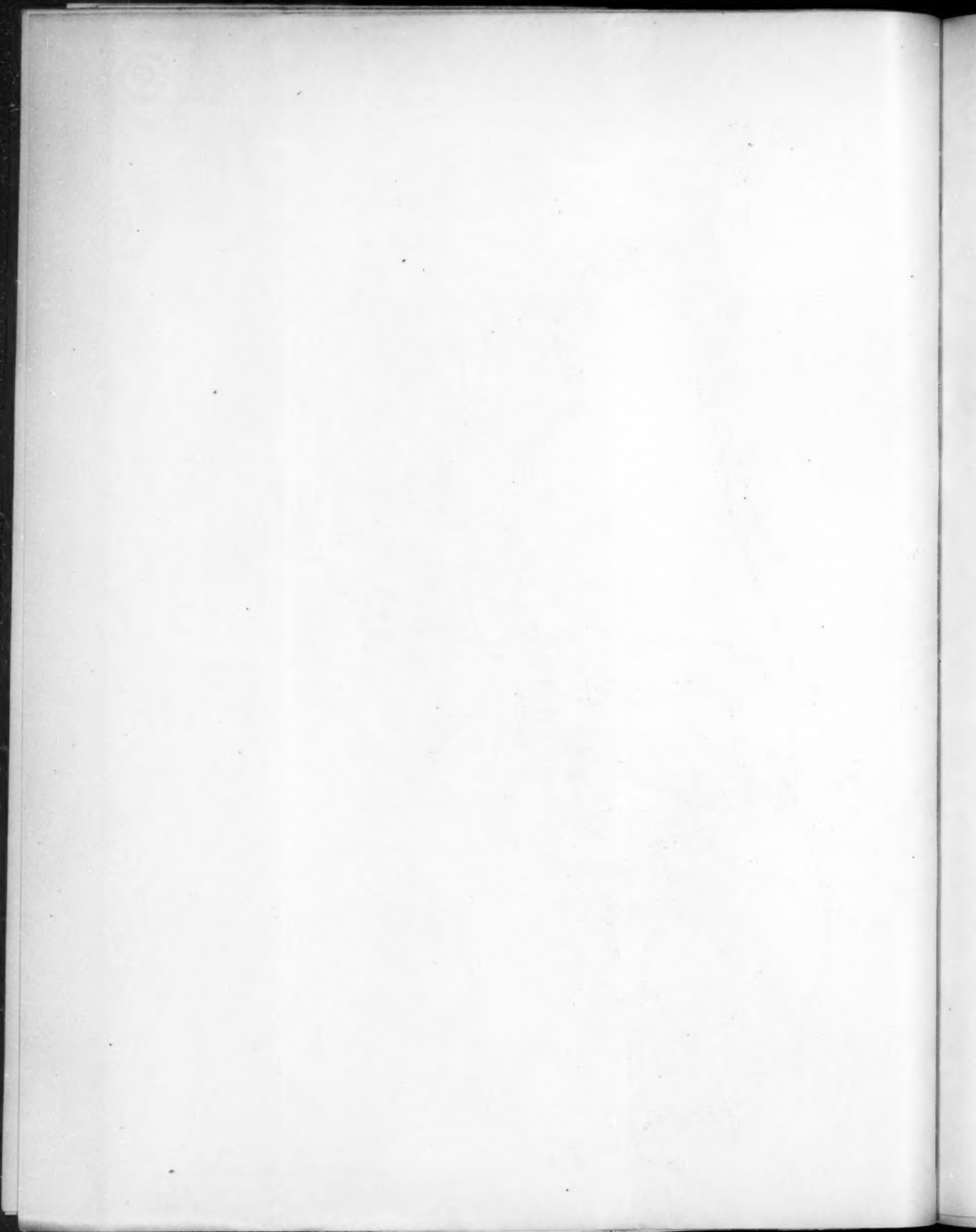
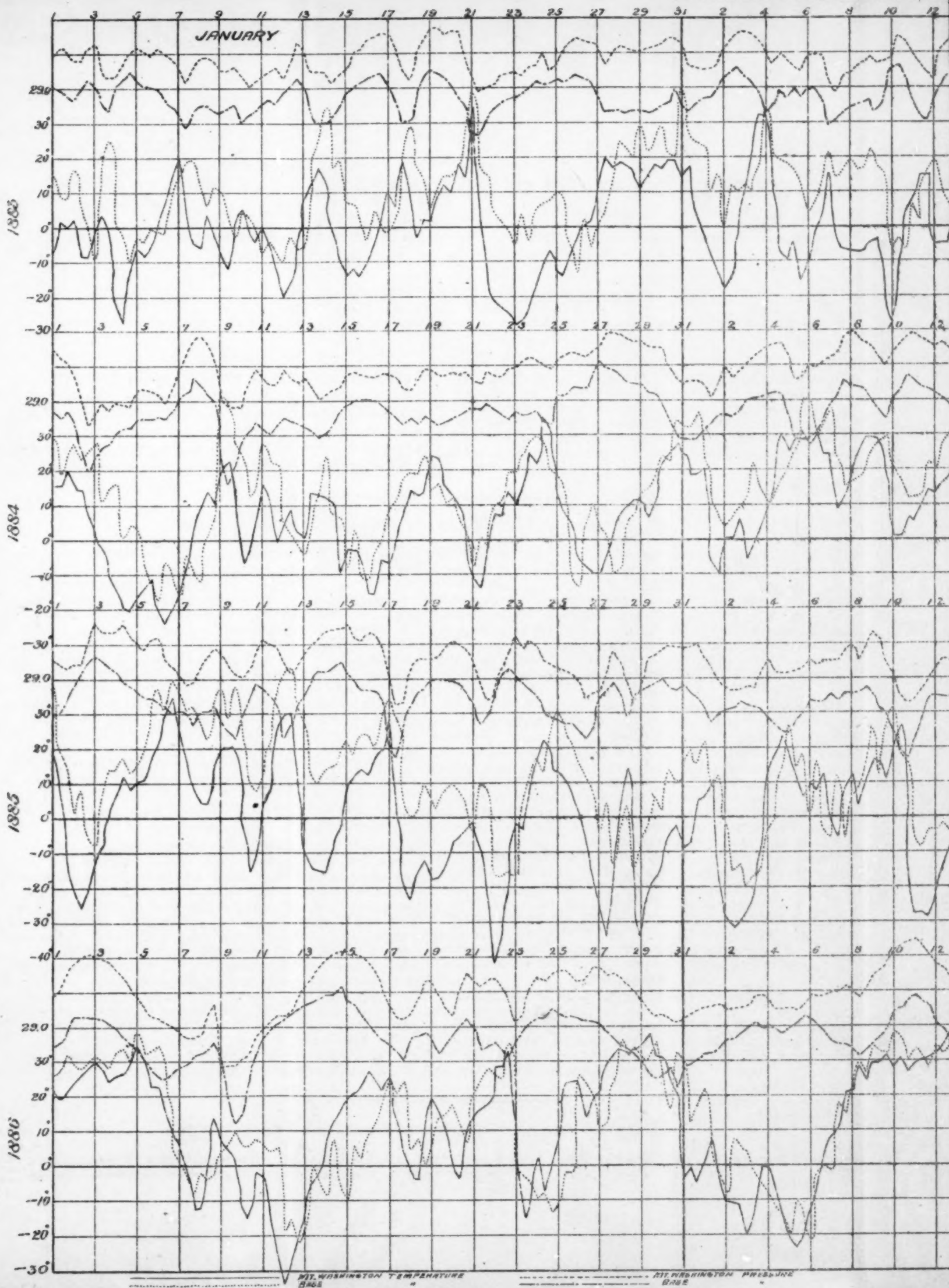


Chart V. Depth of Snowfall (inches) during October, 1891, and Limits of Freezing Weather.



DEPARTMENT OF AGRICULTURE.
 WEATHER BUREAU.
 MAX. W. HANCOCK, CHIEF.
 Following is a list of the names of the
 correspondents for the Weather Bureau
 during the month of October, 1891.





Fluctuations of pressure and temperature near Mount Washington, N. H.

